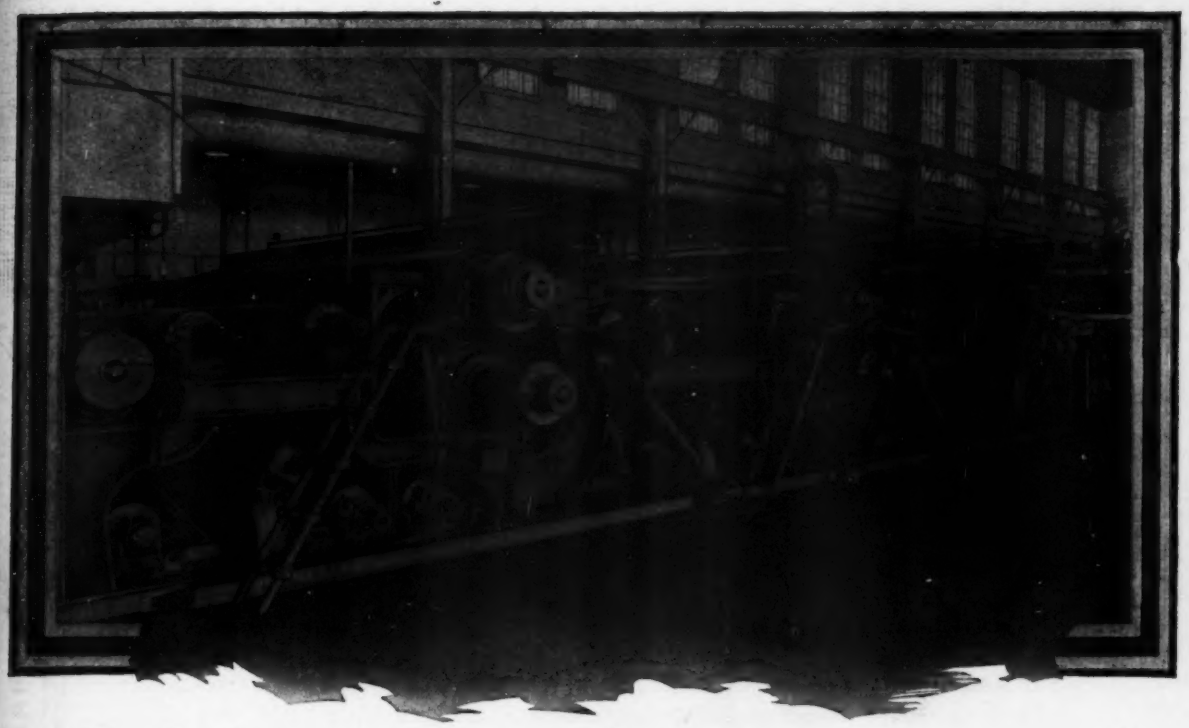

Beloit press section at Thunder Bay

THE press section of this removable Beloit 234-inch, 1200-foot high-speed news machine at the Thunder Bay Mill of the Abitibi Power & Paper Co., Ltd., Port Arthur, Canada, is equipped with the newest modern devices.

This machine is designed to produce 125 tons of newsprint daily, being one of a unit of two producing up to 250 tons of newsprint daily. The bigger the problem, the more the BELOIT will help you.

The removable way is the modern way

BELOIT IRON WORKS, BELOIT, WIS., U. S. A.

Other Beloit Products

Cutters
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BELOIT IRON WORKS PAPER MACH'Y BELOIT WIS

The BELOIT

Vol. 10—No. 12

THE PAPER INDUSTRY

A. SCOTT DOWD
Editor

A MONTHLY EDUCATIONAL JOURNAL
Devoted to the Interests of the Pulp and Paper Industry
THOMAS J. KEENAN, Associate Editor, 18 East 41st Street, New York City

MEMBER AUDIT BUREAU OF CIRCULATIONS

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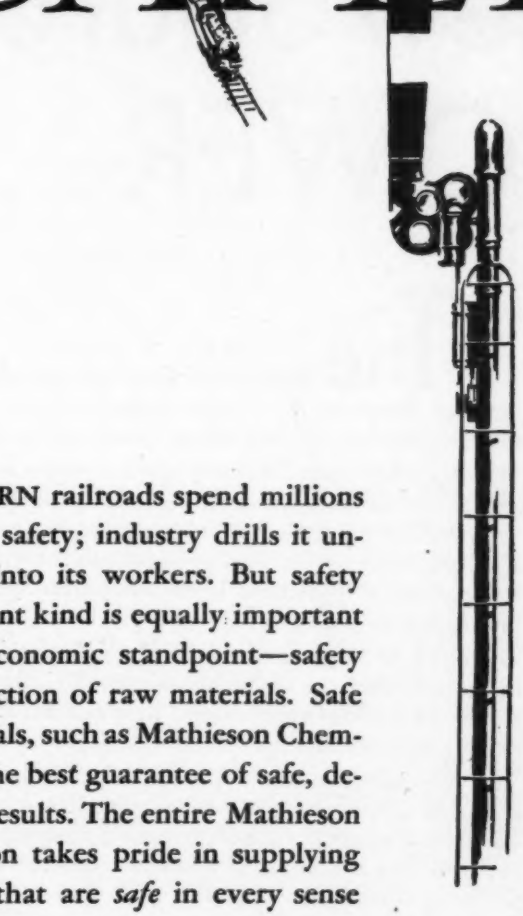
SAFETY



MODERN railroads spend millions for safety; industry drills it unceasingly into its workers. But safety of a different kind is equally important from an economic standpoint—safety in the selection of raw materials. Safe raw materials, such as Mathieson Chemicals, are the best guarantee of safe, dependable results. The entire Mathieson organization takes pride in supplying chemicals that are *safe* in every sense of the word.

The MATHIESON ALKALI WORKS (*Inc.*)
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MATHIESON EAGLE-THISTLE CHEMICALS

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Purite (Fused Soda Ash)
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Ethyl Vanillin
Benzaldehyde
Benzoic Acid
Coumarin
Vanillin

MATHIESON CHEMICALS

A New Source of POWER . . .

The continued industrial expansion of America depends, in a large measure, upon the availability of an ample supply of cheap power.

Industry must rely primarily upon fuel-burning power plants to meet this ever increasing demand for power. The operating efficiencies of the most modern steam plants so closely approach the theoretical maximum that there is little opportunity for further improvement in this direction.

By quickly turning to new economic methods when old ones approach the limit of development, industry has ever pushed forward toward new standards of efficiency and production.

This tendency is evident in a most efficient Industrial Steam Cycle which is now coming into use; a cycle which through the use of high initial steam pressures provides a source of cheap power for any plant using steam for processing.

There has been a definite trend toward the adoption of higher steam pressures in the Public Utility field. Our intimate identification with this development led to the realization that the use of high pressures could be advantageously extended to Industrial plants.

In the application of high pressures to Industrial work, steam is generated at a pressure sufficiently high to develop the amount of power required, when the turbines or engines are exhausting at a pressure high enough to meet the steam needs for process

work. The prime movers thus act as reducing valves and the steam serves a double purpose in its reduction from initial pressure to final exhaust pressure.

The cycle is simple, dependable and economical.

Combustion Engineering Corporation, recognizing the advantages of this application, applied the experience of its research and engineering organizations to the development of high pressure equipment which now makes this cycle commercially available with the same degree of simplicity and reliability which characterize the lower pressure cycles.

Several installations of this type are already in successful operation. Several more are designed and in course of construction.

This Company has developed, manufactured and installed all types of steam generating equipment covering a wide range of pressures up to 1400 lb. per square inch—and, we are now building units to operate at 1800 lb. pressure. This will be the highest steam pressure in commercial use in America and the plant in which these units are being installed, will be the largest steam plant in the world operating at such a pressure.

The use of high pressures involves many engineering problems which necessitate close coordination of fuel burning and steam generating equipment. As pioneers in the development of complete steam generating units—both stoker and pulverized fuel fired types—Combustion Engineering Corporation is in a position to give valuable counsel to those interested in the economies of high pressure steam.

President

COMBUSTION ENGINEERING CORPORATION

International Combustion Building, 200 Madison Ave., New York

A Subsidiary of

INTERNATIONAL COMBUSTION ENGINEERING CORPORATION

A. P. W.

PAPER COMPANY

Albany, New York

A. P. W. Paper Mill, Albany, N. Y.

A. P. W. Pulp Mill, Nova Scotia, Canada

A. P. W. Converting Plant, Albany, N. Y.

Makers of TOILET PAPER, PAPER TOWELS, GROUND WOOD PULP

Wheeler's Idea was *simple and basic*

A young man named Wheeler, fifty-eight years ago, took notice of the inconvenience and waste in the use of flat sheets of wrapping paper by store keepers.

¶ No doubt, thousands of people had seen the same waste and inconvenience, but to this one young man alone came the idea of doing something about it. He said: "Why not have wrapping paper made in rolls, perforated so stone keepers can tear off sheets as needed?"

¶ Convenience and economy were so apparent in the Wheeler idea that it became the basis of a great business. Like most of the really big, simple ideas, this one has had unlimited fields of application.

¶ Wasteful, messy, flat, dust-collecting sheets of toilet tissue, for example, were once used. The Wheeler idea was applied to this class of product, and from that day to the present, the record of the Albany Perforated Wrapping Paper Company has been one of continuous achievement.

¶ For many years the company has confined itself solely to the manufacture of toilet paper and paper towels. It has invented and put into use hundreds of cabinets and devices for the dispensing of these products, and the growth of the company in manufacturing facilities and in sales volume has been such that today it stands as leader in its field.

¶ From hewing its own spruce logs in Nova Scotia, through pulp making, transporting the pulp to Albany, manufacturing the pulp into paper and converting the paper into towels or toilet tissue, the A.P.W. Paper Company controls its processes at every step of the way.

¶ Ever alive to the vital present day need of constantly lowering costs, the company does not hesitate to scrap a machine or a process for something better. It is only by keeping constantly abreast of the times that any company, no matter how old, no matter how strong, can hope to retain the laurels of business leadership.

A. P. W. Paper Company is Representative of Sherman Corporation Clients

THE SHERMAN CORPORATION

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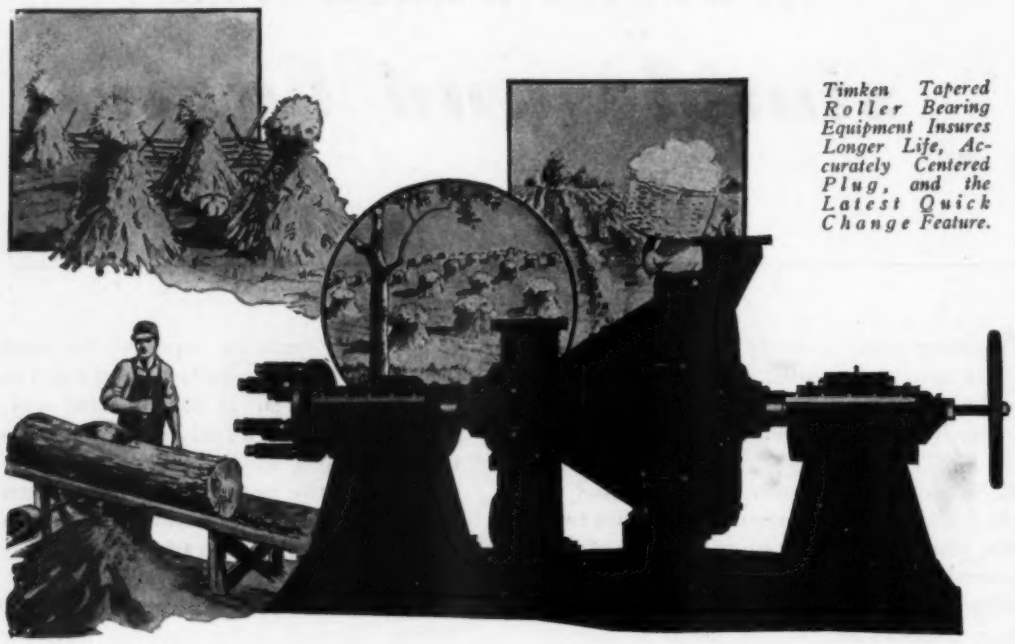

Timken Tapered Roller Bearing Equipment Insures Longer Life, Accurately Centered Plug, and the Latest Quick Change Feature.

Adaptability Of This Claflin Refiner

OUR Claflin Beaters and Refiners are noted for their rugged sturdy qualities with extreme simplicity of design.—They will refine stock, in a continuous process, which cannot be put through another machine.—They are notable for their adaptability for either quick violent refining, or quick gentle brushing.

Copyright 1928

For Every Kind of Pulp

ALONG with regular process refinining on Glassine, Kraft and so forth, Pulp from Corn Stalks, Straw, Cotton Seed Hulls, Saw Mill Waste, Sugar Cane, Ground Wood Tailings, Sulphite or Kraft Screenings is handled with equal facility. The angularity of the knives insures better beating, brushing and hydrating action with less time and power.

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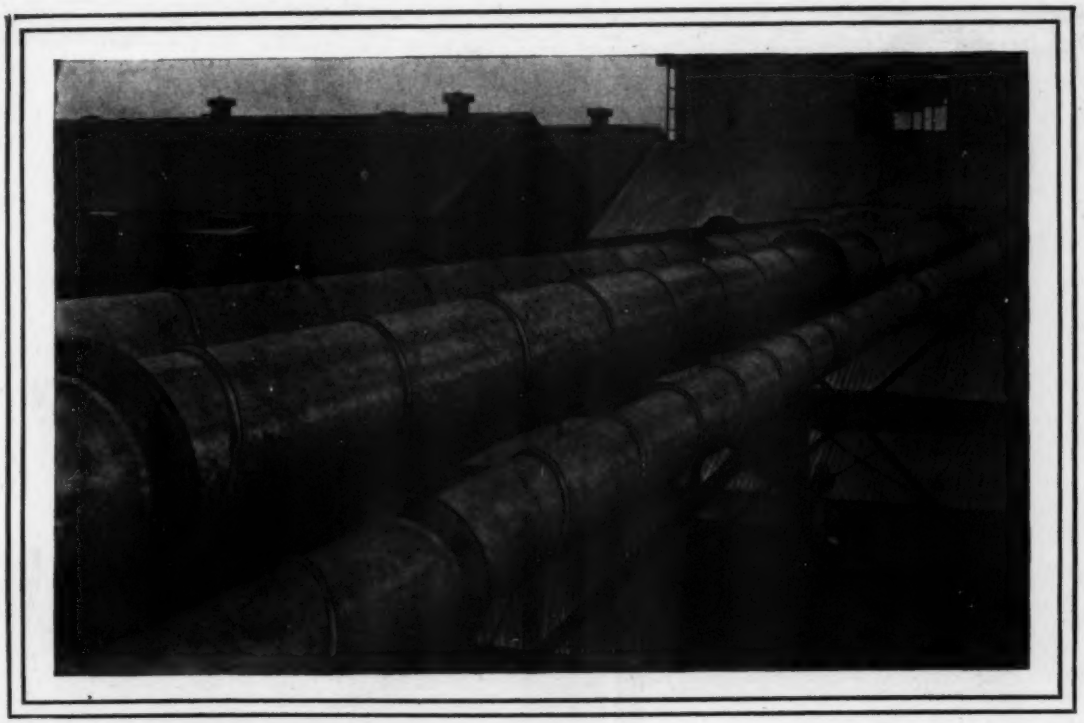


Cleaner Stock Where Naylor Pipe Is Used

—"We often change from a nearly all groundwood pulp to a nearly 100% sulphite and have found that by flushing the pipes are thoroughly cleaned and that there is never any mixture left in the pipes to cause us any difficulty. We have found that your pipes clean very thoroughly by flushing."

—"We find that they have had no trouble whatever with your spiral pipe where a change of color was made in our papers. Our men all state that your spiral pipe cleaned itself and that there was none of the old colored stock left in the pipe in changing onto a new order. It looks as though your theory was correct that the pipe has a cleaning action which keeps it clean at all times."

CLOGGING and sliming of conveyance lines seriously affects the quality of the stock. Add to this the scaling and rusting that occurs in ordinary pipe and the importance of a clean pipe in producing clean stock is apparent.

Naylor Pipe keeps clean for two reasons. The spiral groove sets up a spinning motion which keeps the solid materials in suspension and constantly loosens any particles that would tend to adhere.

In addition Naylor Pipe is made of Toncan Iron which has a superior resistance to rust and corrosion. This is obtained by alloying refined iron with Copper and Molybdenum. Consequently rust troubles disappear when Naylor Pipe is used.

Paper mills that have used Naylor Toncan Iron Pipe report a noticeable improvement in keeping stock clean and uniform.

Naylor Pipe Co.
Main Office and Plant, 1230 East 92nd St., Chicago

Sales Offices:
New York, 25 Church Street — Cleveland, 1367 East 6th Street
Philadelphia, Witherspoon Building — Detroit, 1500 Cadillac Square Building

DUCOMMUN CORPORATION
Los Angeles — San Francisco
Exclusive Distributors: California, Arizona, Nevada and Utah
Montreal, Canada—Mechanical Equipment Company, New Birks Building

TONCAN
Naylor Pipe
Mo-lyb-den-um
IRON

ADDED VALUES
Naylor Pipe coated with lead by the "Leadizing" process gives a resistance to chemical solutions in the paper mill that results in a further protection to your pipe investments.

Toncan Copper Molybdenum Iron is a development of Central Alloy Steel Corporation, the world's largest and most highly specialized alloy steel producer. It possesses a superior corrosion resistance, making it the favored pipe material.

Operating Digesters Scientifically

WHAT goes into the pulp is bound to come out in the paper. Which is why the Oxford Paper Company, of Rumford, Maine, is equipped for scientific control of every vital factor in operating its digesters.

BROWN

THE upper picture shows the digester floor in the Oxford mill. There are three digesters on the floor. A Brown instrument board is provided for the operation of each digester. Two of these boards can be seen in the upper picture. The other view shows a close-up of one of the three boards. Instrument equipment on each board consists of one Brown indicating flow meter for regulating steam input to the digester; one recording and integrating Brown flow meter for checking steam input; one Brown indicating pressure gauge to show pressures in digester; one Brown recording pressure gauge for checking proper "cycle" of pressure variations; and one Brown 2-pen recording thermometer for checking temperatures at top and bottom. The AUTOMATIC RECORDING PLANIMETER—an exclusive Brown feature of the recording flow meter—is especially valuable since it enables the management to tell direct from the chart just how much steam was used in each of the three "cooks" daily turned out by each digester. Write for Catalogs or special information.

THE BROWN INSTRUMENT COMPANY
4489 Wayne Avenue, Phila., Pa.
Branches in 20 principal cities

"To measure is to economize"—PASCAL

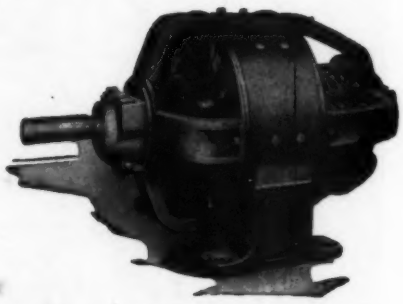
Instruments

These are the motors
for super-calender drive

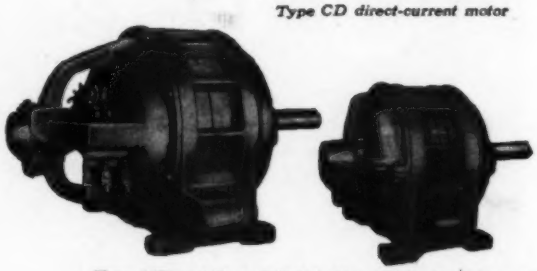
Close speed adjustment over a wide range is the primary requisite in super-calender drive. Where direct current is available, the Type CD motor completely fulfills the exacting requirements; for alternating current, two motors of the required size, Types MT and KT, meet every demand.

Extreme simplicity, superior insulation, push-button control, and, above all, ideal operating characteristics make these motors the most satisfactory drive you can have. Design and construction based on years of experience are your assurance of reliable, economical service.

General Electric supplies complete electric equipment for the paper industry. The advice of specialists is readily available through your nearest G-E office.



Type CD direct-current motor



Type MT and Type KT induction motors for two-motor alternating-current drive

This Type CD motor is giving excellent service at the Mead Pulp and Paper Co., Chillicothe, Ohio

Apply the proper G-E motor and the correct G-E controller to a specific task, following the recommendations of G-E specialists in electric drive, and you have G-E Motorized Power. Built in or otherwise connected to all types of industrial machines, G-E Motorized Power provides lasting assurance that you have purchased the best.

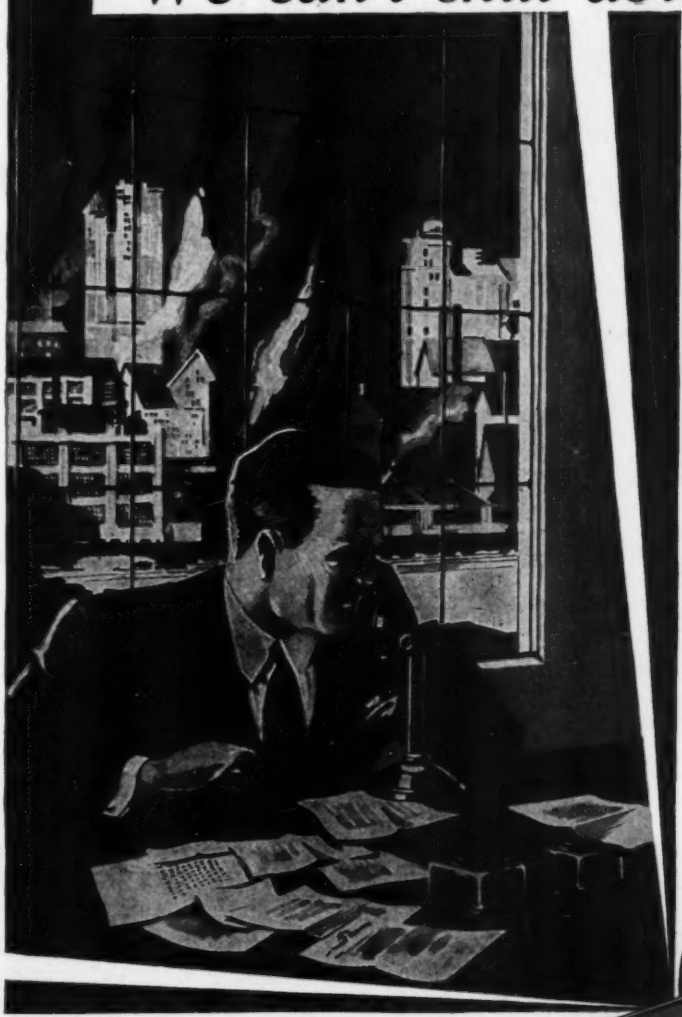
Motorized Power
—fitted to every need

231-18

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

"We can't shut down Number Six! Get it running!"



ANY MAN who puts old-type flexible couplings in a plant is flirting with disaster.

Shut-downs cost money. One machine often stops a whole plant operation.

But as long as machines are connected by couplings made with flexible pins, bushings, springs, discs or grids that fatigue and fail—shut-downs for repairs are bound to get you!

Banish Shut-downs

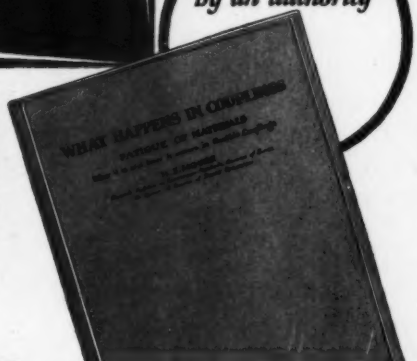
It is all so unnecessary. Thousands of plants have banished shut-downs forever by equipping direct-connected machines with Fast's Self-Aligning Couplings.

From huge rolling mill drives down to 1-inch shaft pumps, fans and other machinery, Fast's coupling absolutely eliminates all chance of failure—because it has no flexible members to fatigue or fail, nothing to wear out, nothing to be replaced.

Start to Stop—Now!

Stop future shut-downs for coupling repairs by seeing to it that all new machinery is equipped with Fast's Couplings. Start now by replacing (before it breaks down again) the most troublesome drive in your plant—and prove what Fast's Mechanical Flexibility means.

Send for Free Book by an authority



USE THE COUPON

Get this authoritative book. It's free. Learn how and why Fast's Flexible Coupling banishes coupling failures forever.

Two spur gears, one on each shaft end, are completely and continuously meshed in oil with the internal gears of a floating sleeve. The shafts and sleeve revolve noiselessly as one unit, allowing free angular and lateral movement.

FAST'S
Self-Aligning
COUPLING

The coupling without flexible bushings, pins, springs, discs, grids or any other flexible materials.

THE BARTLETT HAYWARD COMPANY
213 Scott Street - - - - BALTIMORE, MD.

Please send me the Free Book by Prof. Moore

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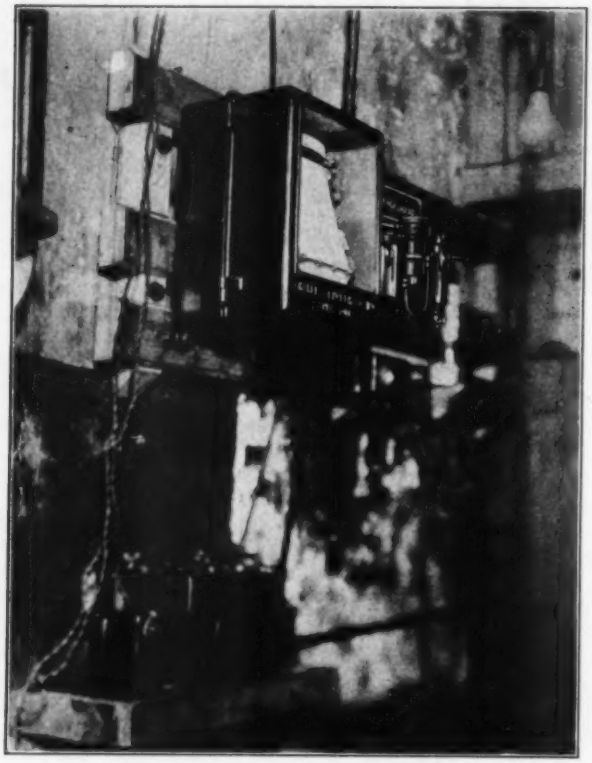


An Engelhard SO_2 Recording Analyzer installation in large Sulphite Pulp Mill

Engelhard

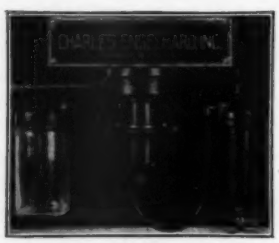
SO_2 Recording Analyzer Reduces *Risks* and *Hazards* in making Sulphite Pulp

"In the first stage of the cooling process the gas passes through a temperature range of 800° to 900° Fahr., *which is a dangerous one for the acid maker;* for if the gas remains too long at this range, the SO_2 is apt to take on another atom of oxygen and form SO_3, which in turn may give rise to sulphuric acid (H_2SO_4) in the system".

Paper Industry

The Engelhard SO_2 Analyzer serves as a warning of admitting too much air or too rapid cooling. It tells when air leaks are causing acid troubles. It enables you to obtain a strong SO_2 gas with minimum SO_3. Furthermore, a temperature record of cooler performance can be incorporated on the same instrument so that you will have a complete picture of the process tendency before you.

Gives exact knowledge of what SO_2 you are holding and also a record of any previous shifts. Plots efficient curves to guide future work. Increases efficiency of men and machinery. Controls quality of pulp produced, detects tendency to trouble in burners, digesters and furnaces in time to prevent it. It assures efficient operation, and prevents waste of sulphur, fuel, time and labor.



SO_2 Analyzer

CHARLES ENGELHARD, Inc.

233 N. J. R. R. Avenue Newark, N. J.

RECORDING AND INDICATING INSTRUMENTS :: AUTOMATIC TEMPERATURE AND GAS CONTROL
GAS ANALYZERS :: THERMOCOUPLES :: THERMOMETERS :: PYROMETERS

New Engelhard SO_2 Analyzer Bulletin gladly mailed you upon request

Branches: New York, Boston, Pittsburgh, Cleveland, St. Louis, Montreal, Ottawa, Toronto, R. E. Chase & Co., Tacoma, Wash., Queen City Steel Treating Co., Cincinnati, Ohio, Jensen Instrument Co., Los Angeles, Cal.

Pulp Beater at B. D. Rising Paper Company shown equipped with Bristol's Pulp Beater Recorder.

The same uniform results day after day under direction of BRISTOL'S Pulp Beater Operation Recorders

EVERY detail of Beater operation—from the moment the roll is first lowered, until it is lifted at the end of the beat—is clearly and accurately shown on the chart records made by Bristol's Pulp Beater Recorders. Exact time and extent of each roll change is automatically recorded—thus making it possible for operatives to successfully maintain the correct relation between bedplate and roll at all times.

Without such information as a check, beater operation is almost entirely dependent upon the experience and judgment of the operator or superintendent. And as no two operators seem to have the same ideas as to how certain grades of stock should be beaten, the result is often spoiled stock, an inferior grade of paper, or at best a paper that is not uniform in strength or texture.

Recorder Simplifies Control

As evidence of greatly improved production methods which can be effected thru use of Pulp Beater Recorders it is interesting to note that several mills, using the recorder as a basis, have worked out schedules by which over 95% of the beating is standardized on charts. To illustrate: the operator is instructed to start beating by dropping the roll until the instrument pen is on a certain graduation of the chart. After holding the roll in this position for a pre-determined time, it is again dropped until the pen reaches another selected graduation. And so on, until operation is completed.

*Bulletin No. 368

Nothing to Get Out of Order

The construction of Bristol's Pulp Beater Motion Recorder is very simple. The lever arm, as shown in accompanying illustration, passes up through a slot in the bottom of the case, attaches directly to the pen-arm and records on the chart without the aid of multiplying levers. Thus there are no complicated parts to get out of order.

Complete description in new Bulletin No. 368, Write for a copy today.

Sales Engineering Service without obligation

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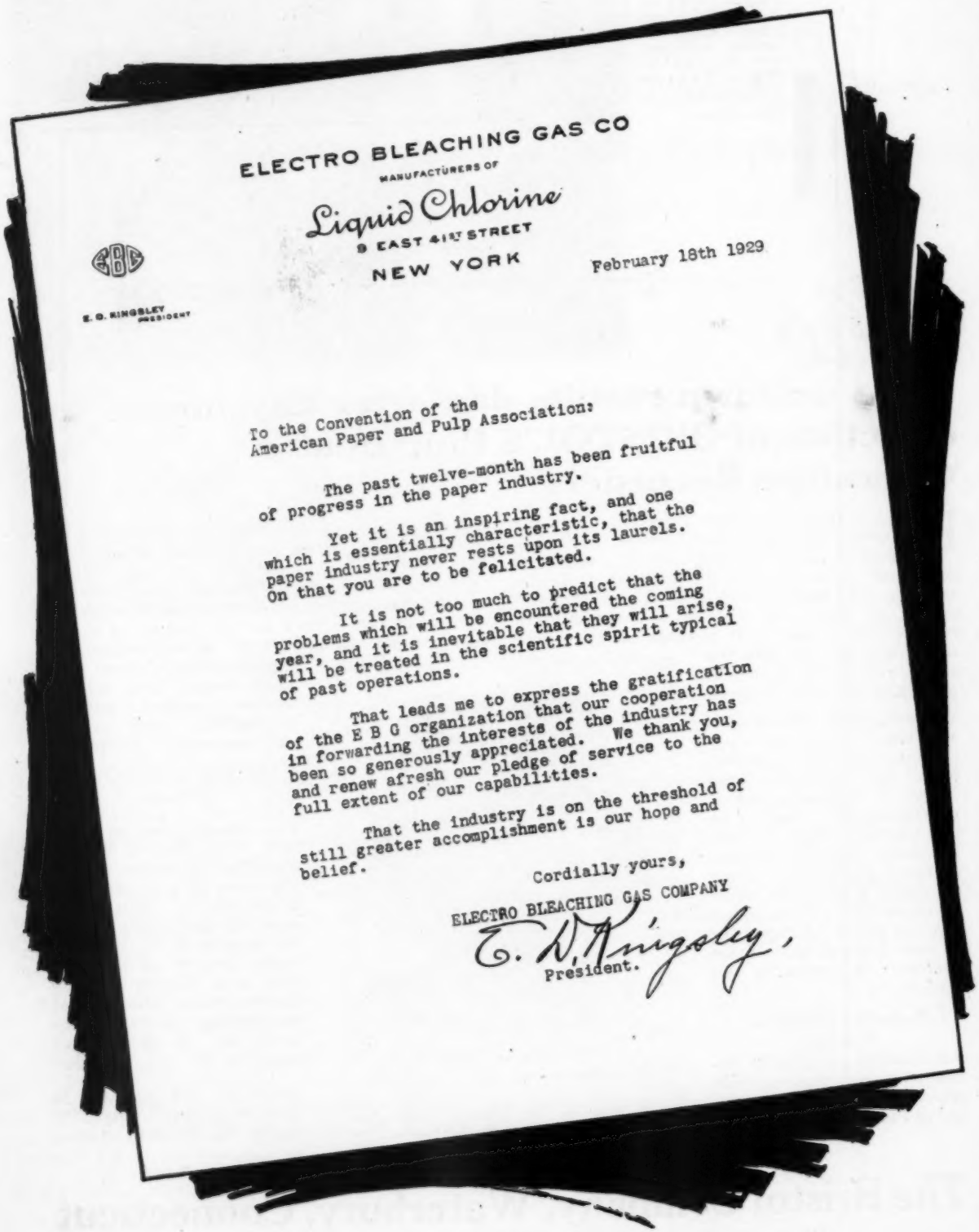


ELECTRO BLEACHING GAS CO

MANUFACTURERS OF

Liquid Chlorine

9 EAST 41ST STREET

NEW YORK

E. D. KINGSLEY, PRESIDENT

February 18th 1929

To the Convention of the
American Paper and Pulp Association:

The past twelve-month has been fruitful of progress in the paper industry.

Yet it is an inspiring fact, and one which is essentially characteristic, that the paper industry never rests upon its laurels. On that you are to be felicitated.

It is not too much to predict that the problems which will be encountered the coming year, and it is inevitable that they will arise, will be treated in the scientific spirit typical of past operations.

That leads me to express the gratification of the E B G organization that our cooperation in forwarding the interests of the industry has been so generously appreciated. We thank you, and renew afresh our pledge of service to the full extent of our capabilities.

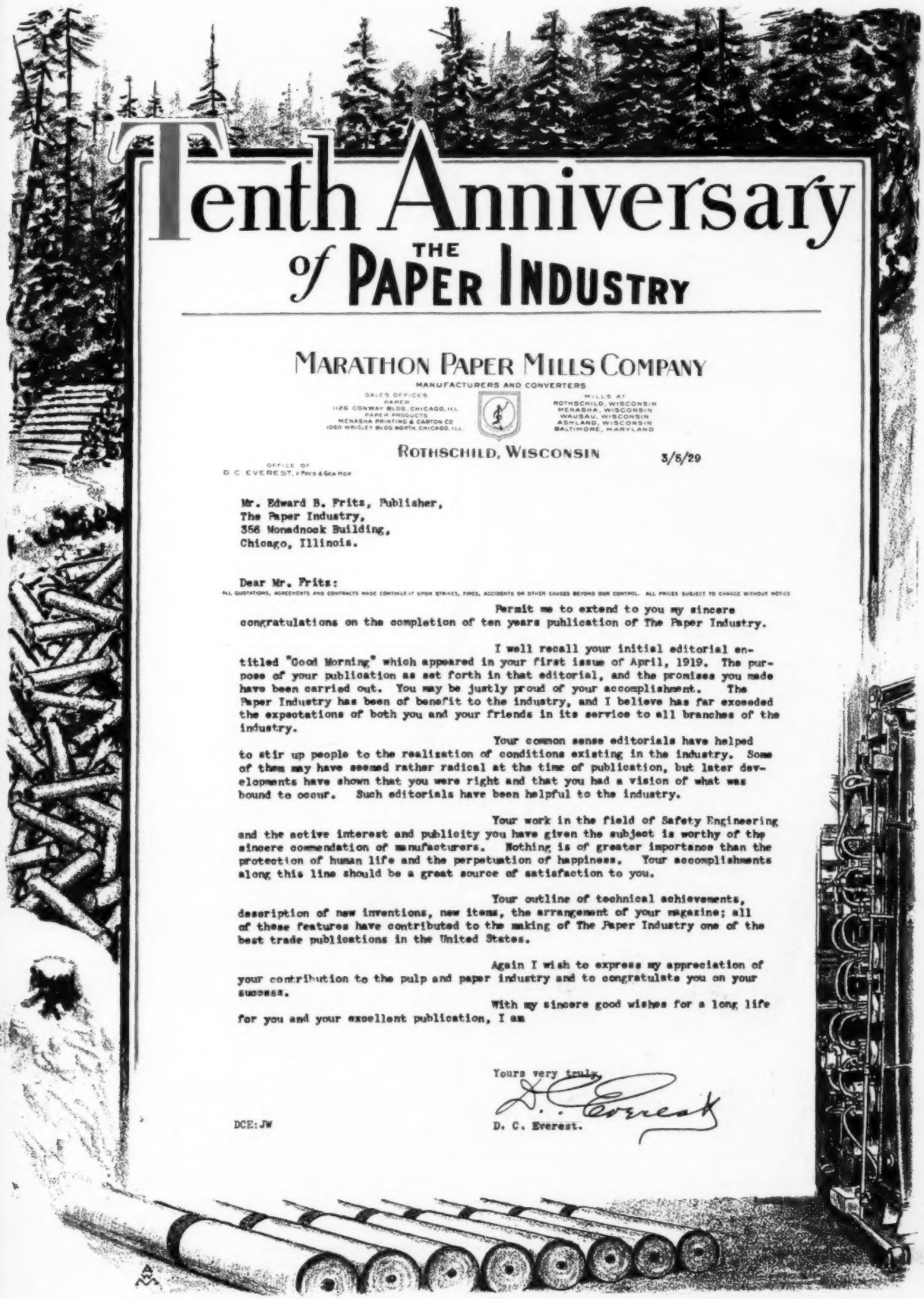
That the industry is on the threshold of still greater accomplishment is our hope and belief.

Cordially yours,

ELECTRO BLEACHING GAS COMPANY

E. D. Kingsley,

President.



Tenth Anniversary of THE PAPER INDUSTRY

MARATHON PAPER MILLS COMPANY

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MENASHA, WISCONSIN
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ASHLAND, WISCONSIN
BALTIMORE, MARYLAND

ROTHSCHILD, WISCONSIN 3/5/29

OFFICE OF
D. C. EVEREST, V. PRES. & GEN. MGR.

Mr. Edward B. Fritz, Publisher,
The Paper Industry,
356 Monadnock Building,
Chicago, Illinois.

Dear Mr. Fritz:

ALL QUOTATIONS, AGREEMENTS AND CONTRACTS MADE CONTINGENT UPON STRIKES, FIRES, ACCIDENTS OR OTHER CAUSES BEYOND OUR CONTROL. ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Permit me to extend to you my sincere congratulations on the completion of ten years publication of The Paper Industry.

I well recall your initial editorial entitled "Good Morning" which appeared in your first issue of April, 1919. The purpose of your publication as set forth in that editorial, and the promises you made have been carried out. You may be justly proud of your accomplishment. The Paper Industry has been of benefit to the industry, and I believe has far exceeded the expectations of both you and your friends in its service to all branches of the industry.

Your common sense editorials have helped to stir up people to the realization of conditions existing in the industry. Some of them may have seemed rather radical at the time of publication, but later developments have shown that you were right and that you had a vision of what was bound to occur. Such editorials have been helpful to the industry.

Your work in the field of Safety Engineering and the active interest and publicity you have given the subject is worthy of the sincere commendation of manufacturers. Nothing is of greater importance than the protection of human life and the perpetuation of happiness. Your accomplishments along this line should be a great source of satisfaction to you.

Your outline of technical achievements, description of new inventions, new items, the arrangement of your magazine; all of these features have contributed to the making of The Paper Industry one of the best trade publications in the United States.

Again I wish to express my appreciation of your contribution to the pulp and paper industry and to congratulate you on your success.

With my sincere good wishes for a long life for you and your excellent publication, I am

Yours very truly,

D. C. Everest

DCE:JW

D. C. Everest.

Conception

"Good Morning"

THIS is the initial issue of THE PAPER INDUSTRY. We sincerely hope that you will like it. We are as yet in our swaddling clothes, of course, and we trust you will bear with us for a while, and we hope to show before long that our heart is in the right place.

THE PAPER INDUSTRY will never contain a line of scandal, anything of a deleterious nature, in other words—loud talk. Its pages are not for the purpose of captious criticisms; its province is not to berate those in the Trade who do not agree with us, or to publish the shortcomings of anyone. It is published in the interests of the whole industry, and for everyone who has the best interests of the paper industry at heart.

We hold only the best wishes for the other publications in the Trade. They have their field, but it is quite a different one from that which we will attempt to cover. Our plan will be outlined from time to time, as it would hardly do to tell all about it here, but we shall try to meet the approval of the readers with the perspicuity with which it is edited. THE PAPER INDUSTRY is published in the hope that we may be able to be of benefit to the industry. The publisher is known from his many years in the industry, and we are just a little proud to say that in the twenty-five years that he has worked and traveled among the people in the industry, he has never made an enemy, has never done an unkind thing to anyone connected with the Trade, and sincerely hopes that he never will. If there should ever anything appear in these columns that will hurt the feelings of anyone, we wish to be reminded of it, and we will be very sorry, indeed, and will be only too glad to ask the pardon of the offended person, no matter whether he be considered great or small in the industry.

THE PAPER INDUSTRY is not published in the interests of any one man, or any set of men in the Trade, but in the hope and with the fondest desire that we may be able to furnish material for serious thought which may help those in the industry to do their work better, to make paper a little better at a little less cost, and to disseminate information that may be of great value to everyone in the industry.

To make THE PAPER INDUSTRY what we would like to have it, and what you would like it to be, we will need the help and good will of everyone in the industry, and we sincerely hope we will have it. If we do, then we will strive all the harder to be of service.

The great industry of making, selling and printing of paper is not a Trade, but the best of all American industries, with the biggest and best men in America in it, and we beg to be,

Your Humble Servant,

THE PAPER INDUSTRY.

Pictures of the first and recent issues of The Paper Industry. The small inset is that of the April, 1919 issue containing 84 pages. The January, 1929 issue contained 182 pages. There is no difference in the page dimensions.

Reprint of the first editorial published in the April, 1919 issue of The Paper Industry.

From an Idea to the Ideal

By EDWARD B. FRITZ

THIS issue of THE PAPER INDUSTRY completes the first ten years of existence of this publication. Ten years ago we had an idea, which had been in our brain for a long time, as to what we then believed would be a real type of educational publication for the manufacturers of paper and pulp and their men. It is a long distance from an idea to the realization of an ideal. In these ten years we have given our best of time, effort, and money to produce the type of publication that we have felt would be helpful to the men in this great industry. To-day, more than 5000 copies are subscribed for by paper and pulp manufacturers and men in the mills, and thousands of others read each issue.

We are still a long way from the ideal, but we have at least accomplished something, and from the many kind words and letters that we have received from our good friends, we believe at least that we have been all of these years and are now on the right road. Therefore we shall strive all the harder, and shall devote our time and effort and money during the coming years to make THE PAPER INDUSTRY more worthy of support by this great industry, and by those firms who want to do business with the manufacturers and their men.

We feel very humble and grateful to-day for the generous support we have received in the industry, both by paper and pulp manufacturers and their men in subscribing for THE PAPER INDUSTRY, and to the many advertisers who have been with us almost continuously since the first issue.

No publication can succeed without this type of support and patronage. We have given in return our very best, though we realize that it was only through the kind cooperation of the manufacturers and the advertisers that we were able to go forward as we have done.

It might be interesting to note that while there were naturally only a few advertisers in the first issue of THE PAPER INDUSTRY, some of these few have been represented in practically every issue for the whole ten years. Among these are the Appleton Wire Works, Appleton, Wisconsin; The Moore & White Company, Philadelphia, Pa.; The Lindsay Wire Weaving Company, Cleveland, Ohio; Cameron Machine Company, Brooklyn, N. Y.; Hill Clutch Machine & Foundry Co., Cleveland, Ohio; Holyoke Machine Company, Holyoke, Mass.; B. F. Perkins & Sons, Inc., Holyoke, Mass.; Hungerford & Terry, Inc., Clayton, N. J.; Union Screen Plate Company, Fitchburg, Mass.; Buffalo Steam Pump Company, Buffalo, N. Y.; Roberts Manufacturing Company, Lockport, N. Y.; and several others.

Soon after this first issue, when THE PAPER INDUSTRY began to show some real signs of life, other advertisers started in with us and have been with us in practically every issue since then.

To all of these individuals and firms we are most grateful, as well as to those other firms who came with us later and have continued with us most of the time since.

It takes something more, however, than subscriptions and advertising to make a real publication. On another page can be found pictures of those men whose efforts have helped to make THE PAPER INDUSTRY what it is. Each one of these men has done his part of making THE PAPER INDUSTRY a success. Most of them have been with this publication for a long time, and we are sure that each and every one of them has given his very best toward the success of this publication, and we feel that it is due them to reproduce their pictures here and to show the industry just what each one of these men look like.

A. Scott Dowd, the editor, has been with us for more than nine years. His life work has been devoted to the paper interests, or the closely associated industry—printing.

Thomas J. Keenan, associate editor, located at the New York office, is well-known in the industry as formerly editor of another journal in this field, and one of the organizers of one of the important associations in the industry. He has been with us for some five years.

Harry E. Weston, who devotes his time to research work and advertising, has been with us nearly two years. Starting his life's work in a pulp mill, later with one of the best known chemical engineering firms in this country, then professor in pulp and paper manufacturing at the New York State College of Forestry, at Syracuse, New York, and later with a firm selling paper mill machinery, gave him an ideal background for his present work.

John D. Henderson has been with us since the early days of this publication. His time is devoted to research and subscription work. All of his time is spent in the mills keeping in close touch with the manufacturers and the men.

G. D. Wyatt came with us soon after this publication was started, and has charge of the New York office.

Chas. G. Weyant has charge of the New England territory and State of Pennsylvania, and has worked in this capacity for about five years.

We are only reproducing the pictures of those men who devote all of their time exclusively to THE PAPER INDUSTRY and the Paper and Pulp Mill Catalogue. There are others to whom we are also very grateful; Wm. Sibley, for instance, who writes for every issue of THE PAPER INDUSTRY; Harry Williamson, whose Lessons in Paper Making have been of so much help to paper and pulp manufacturers and their men. There are others who devote considerable effort to THE PAPER INDUSTRY, whose names we are not mentioning here, but we are sure that they will understand they are included in this list.

On another page is reproduced the editorial, "Good Morning", which was the first editorial in the first issue of THE PAPER INDUSTRY. At that time we just had an idea and were looking toward the ideal. We believe we have kept faith with this first announcement. As was stated in that editorial, we had the kindest of feeling for all competitors in our field, and this same thought applies to-day as much as then. Each of us has his own work to do and his own field to cover. We feel sure that any man who has the best interest of this great industry at heart cannot feel otherwise.

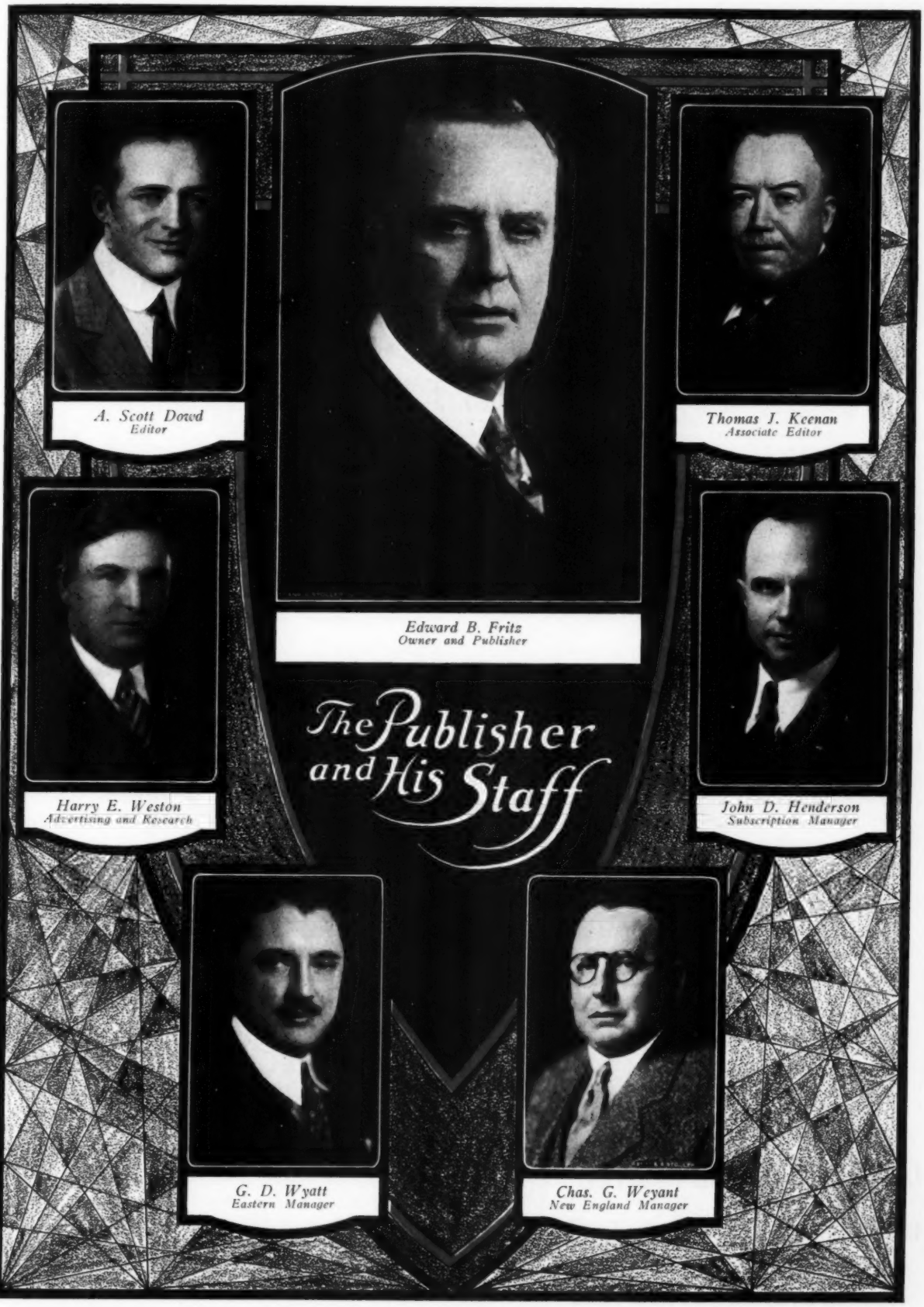
May we point out this one thought: We intend to devote the coming years trying to make THE PAPER INDUSTRY bigger and better and more helpful to paper and pulp manufacturers and their men, men who are responsible for the kind and quantity of the product of the mill. If these men are pleased and benefitted by reading THE PAPER INDUSTRY—and it would seem so from the way the number has increased every year, then the advertiser cannot help but be benefitted.

Our other publication, THE PAPER AND PULP MILL CATALOGUE, was started in 1923. The reason for this publication is that managers, superintendents, purchasing agents and other men connected with mills are constantly in need of information concerning machinery, equipment, supplies, etc., and this information has been available only by searching through individual catalogues, pamphlets, circulars, and what not, with the possibility of even then not finding what is being looked for.

This publication is devoted to listings of practically everything for which these men have any need. It gives them the names and addresses where they can write for further information or prices, etc. The catalogue pages themselves aside from the listings give information about the types of equipment, supplies, etc. that these mill men want. All of this information is in one handy volume always at their elbow. Beginning with the 1928 issue, we started an engineering section which we have been told has been of inestimable value to manufacturers and their men. This section will be much enlarged in the 1929 issue.

The pleasant part of this publication to the manufacturers and their men is that it is given free to them without any strings whatsoever. To the small mills, one copy is sent; to the medium-size mills, generally two; and to the larger mills, more copies, so that every individual who either has the buying or suggests the buying of equipment can have his own copy, and this is another proof of the work we are trying to do for the benefit of the paper and pulp manufacturer and his men.

This is the ideal toward which we are going: **To be of the greatest service to the largest possible number of paper and pulp manufacturers and their men.**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Thomas J. Keenan
Associate Editor
Edward B. Fritz
Owner and Publisher
The Publisher and His Staff
Harry E. Weston
Advertising and Research
John D. Henderson
Subscription Manager
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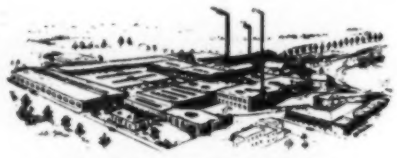

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PAPER MANUFACTURERS
SPRING GROVE, PA.

January 8, 1929

L. V. Estes Incorporated
4753 Broadway
Chicago, Illinois

Gentlemen:

We are pleased to receive your final report. The recommendations made are now being carried out, and show a decided increase in savings over past performance.

We wish to express our entire satisfaction with the service your Company has rendered, and feel you have accomplished what you set out to do.

Very truly yours,
P. H. GLATFELTER COMPANY,

PHG'KMH Vice President.

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ESTES SERVICE
Raises the Efficiency of Factory & Office

Seventeen consecutive years serving Industry

Endorsed by many of the best known Paper Mill Executives in this country

L. V. ESTES INCORPORATED
Industrial Engineers
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OFFICE OF
D. C. EVEREST, Vice President

11/10/28

L. V. Estes, Inc.,
4753 Broadway,
Chicago, Ill.

Gentlemen:

We wish to express our appreciation of the services you have performed for this Company over the period of the past eighteen months. This work included the installation of a wage incentive plan and the revamping and rearrangement of various old bonus plans which had been in use since 1913. The results obtained have been very gratifying and we will be pleased to recommend your service, as we have done in several instances, to other manufacturers.

Yours very truly,
MARATHON PAPER MILLS COMPANY

DCE:JW Vice President & General Manager.

Good versus Bad Management

UPON analysis of the policies of any of our successful corporations, it will be found in every case that the success of the company is due to "good management." It is the management of the corporation which determines the policy of any company making and selling commodities. But management is of many kinds and has a variation of manifestation as great in degree as the experience, background and character of the managers vary one from another. However, management today falls into two major classifications — "good management" and "bad management."

"Bad management" is and has been prevalent in a vast majority of corporations in the various divisions of industry in this country during the past ten years.

"Bad management" has been responsible for **Overproduction**—that crushing evil growing out of the post-war deflation.

The primary cause of **Overproduction** in any industry is found to be ignorance, prejudice and willful disregard of all the fundamental principles of production and merchandising.

A management, therefore, which actively operates upon the theory that "my mill must run; therefore, we shall take orders at any old price", is "bad management" and "bad management" indulges in **Overproduction**—and **Overproduction** makes deficits instead of profits.

Contrast such management with the postulates for "good management" laid down recently in an address by Owen D. Young, that premier of good managers, who has always managed his corporations so that good profits continuously have accrued to his investors and stockholders.

He says that "good management" operates under the following obligations to stockholders, workmen, consumers of product and the public at large:

First, that invested capital is safe and paid a fair rate of interest return.

Second, that workers get fair wages and continuous employment.

Third, that customers get goods as represented at reasonable prices.

Fourth, that the concern functions in public interest as a good citizen should.

Every manager of every corporation in the paper industry should paste those four postulates of "good management" in his hat and make them the cardinal principles of his management.

For observe, Mr. Young states that "profit" is the first essential of industry.

This will be a revolutionary idea to most paper mill managers, who are now and have been operating upon the theory that "production" was the essential of industry. We produce that we may have profit. When we over-produce, we have no profit.

Without building all plans for production and sale of commodities around this central basic profit, none of the other three postulates laid down by Mr. Young are possible.

Without profit, workers get slim or no wages and have no continuity of employment.

Without profit, customers cannot obtain "standard value" goods, commodities are misrepresented and prices obtained are unreasonable.

Without profit, the concern functions as a bad citizen for it justifies its commission of unfair

E D I T O R I A L

practices on the ground that it "must keep going."

"Good management" has shown the public that even in deflationary years, good profits can be made and made continuously. Little wonder, then, that the public supports all those corporations under Morgan management. Morgan management is good—ever profitable. The public eagerly buys the securities of a Morgan-managed concern.

The paper industry sorely needs "good management". The "bad management", which has in conspicuous cases willfully sponsored increased **Overproduction,** thereby eliminating all profits for its own concern and placing unfair losses upon all other concerns in the industry, must in turn be eliminated.

We are pleased to note the increasing evidence along the industrial line of the elimination of "bad managers" and "bad management."

"Good management" must come to be the dominant operative function in the paper industry. When "good management" obtains, then, **Overproduction** ceases and profits again flow into the treasuries of the paper corporation, and this glorious, essential, growing industry of ours will rise to the standard of excellence that it should enjoy among the galaxy of successful industries in America.

Profitless Prosperity

ONE of the most important subjects that was talked over during the recent meetings in New York, aside from present conditions in the industry and overproduction, was the subject of research. Naturally, this subject was brought up more often by the production men. A number of people referred to the article in the February issue of this publication on "Research in Pulp and Paper Work" which was an account of the fundamental research studied and initiated by the Technical Society of the Norwegian Paper Industry. In another part of this issue will be found a number of comments on this article.

The subject of research is a very important one in all branches of industry. In most any line of work, if you will corner the ordinary business man and ask him what he thinks of research, he may say that he heartily approves of it and is spending large sums on scientific investigations. On the other hand, he may return the answer that he thinks it is a lot of foolishness, that he makes his business pay by attending to main issues and not running around dabbling in small subjects. Whatever he may say, however, if he is a real student of business, his answer will indicate that he has had this question constantly before him.

Few men will care to wager on just what is to be done in any industry (and this applies to the paper industry) within the next few years. When we consider that more than 30,000,000 people earn a living from five leading industries, which either did not exist or were only on a small scale thirty years ago, we can get some idea of the changes that are going on. The automobile, motion pictures, radio, chemical and electrical industries are products of the last three decades. During that time, some of these have come into existence and have grown to tremendous importance, while some of the others were comparatively small in comparison to what they are today.

In most industries, the management of a plant can hardly look forward for a year or two and know whether they will have profitable prosperity or profitless prosperity. We have seen too many cases where a new industry has sprung up, and to a large extent wiped out many old industries. For instance, what has become of the big manufacturing plants that a few years ago made carriages, buggies, etc.? Only one of these, as far as we know, is now prominently before the public, the Studebaker Corporation, and this organization seemingly saw what was coming and changed over to the manufacture of automobiles, instead of buggies and carriages.

The following quotation taken from a publication published by one of the banking companies in Chicago might be of interest on the same subject and points out to the average paper manufacturer, as well as those in any other industry, that it is necessary to keep up with the procession that is so rapidly marching forward these days.

"For eleven years the Victor Talking Machine Company paid dividends of $42.00 per share on its common stock and in 1922 paid a 600 per cent stock dividend. It was considered one of the best organized and most profitable corporations of its time. Meanwhile, research developed radio and the Victor company passed its dividend. Not until the Bell Telephone Company produced in its laboratories the orthophonic victrola, which was taken over by the Victor company, were operations again conducted on a profit basis.

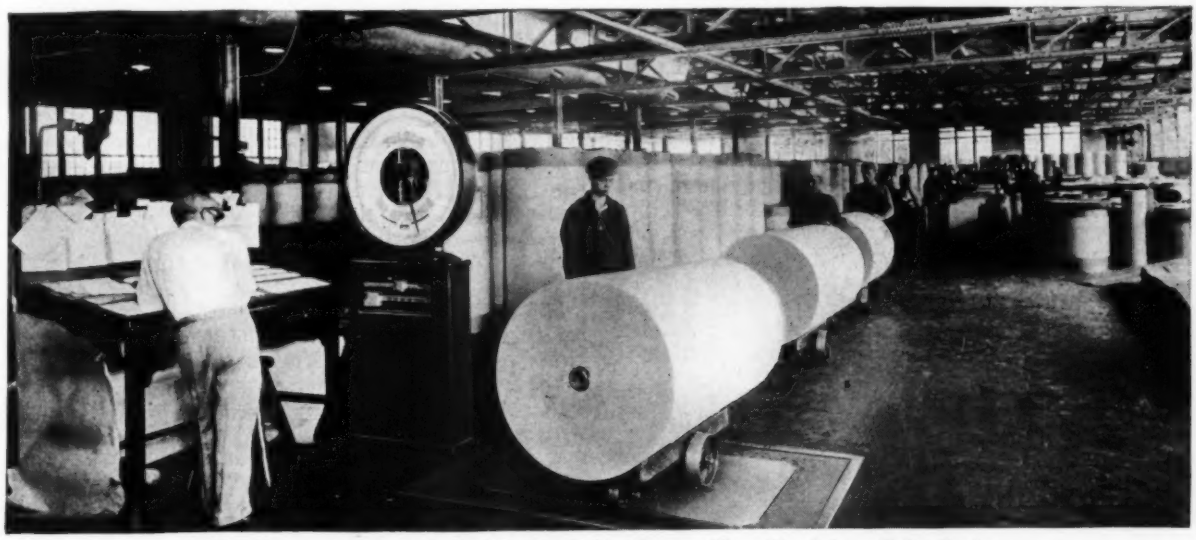
"Leading bankers have begun to realize that the financial and commercial position of the industry or an individual company as revealed by the balance sheet and annual earnings statements are not the only factors to be considered in judging strength and durability.

"Research facilities, the attitude of the management toward research and the efficiency with which research is conducted are conditions behind the balance sheet which should be thoroughly investigated before any concern can be wisely financed today. Far-sighted executives are doing their utmost to maintain their scientific staff intact, and are giving it primary consideration when changes in other departments are necessary.

"The future ability of our industrial concerns to meet their obligations and pay dividends depends very largely upon the efficiency of their research departments. Science is now advancing at a rate so rapid and results are of such far-reaching influence that no industry can hope to ignore research and live."

The paper manufacturer who is not using every reasonable means to manufacture his product for less cost, to cut out every possible waste, will realize his mistake when it is too late. Also the manufacturer who keeps unto himself, and who is not

100% ON THE JOB



Weighing newsprint at the St. Maurice Valley Corp. mill at Shawinigan Falls, Quebec

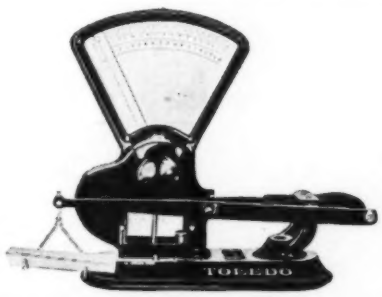
Toledo Scales *guard production and profits with tireless accuracy*

BUYING . . . manufacturing . . . selling . . . at every stage in the work of a paper mill . . . weight, *accurate weight*, is of the utmost importance.

Losses mount with annoying speed when faulty weighing creeps into any part of the plant. And the worst of it is, such leaks may remain undiscovered for days, weeks and months.

Toledo scales are famed for their dependability. Accurate to a hair, sturdy and rugged in the daily drive of high-speed production, economical because of their long life and permanent working fitness.

There is a model too, for every part of the modern paper mill—a model specially constructed to do a certain job with the least human effort and the greatest mechanical efficiency. Sorting room scale,



MODEL 0330, *Paper Ream Scale. Checks mill production for uniformity. Figures weight of 1000, 500, and 480 sheets of paper from the weight of a single sheet.*

batch weigher, mill room, finishing room, shipping room, coating room . . . a Toledo Scale for every place—and a scale that *pays its way* in actual performance.

Send in the coupon for detailed information about why Toledo can do a better job for you.

Mail Coupon Today!

TOLEDO SCALE CO., PI-1
Toledo, Ohio

Please send me your catalog of Toledo Scales specially designed for mill use.

Name.....

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NO SPRINGS · HONEST WEIGHT

E D I T O R I A L

ready to give out those things which he learns that are new, and take in those things which other people find that are new, will find that he has been making a mistake.

This is an age of competition and overproduction in our industry, and it is apparent that the mill that turns out the best product at the least possible cost would be the one that will have profitable prosperity. It is sure that the management that continues to go along in the old rut, without improving and cutting out excessive costs, will find that theirs has been a profitless prosperity.

This publication can and is willing to be of help to manufacturers and their men in many of their problems. It is only necessary that many of them be taken up with us to often find a real solution.

When "The Paper Industry" Was Started

WHEN THE PAPER INDUSTRY was started ten years ago a good beginning had been made in bringing the technical men of the industry together for the exchange of information and knowledge of methods and processes. The Techical Association of the Pulp and Paper Industry had been organized some three years and was already performing a useful function in assembling men and material for the new developments in scientific pulp and paper manufacture that were taking shape in the minds of the leaders in the industry.

The publisher of THE PAPER INDUSTRY was early convinced of the need of organization among the superintendents and other skilled workmen employed in pulp and paper mills, not for political or similar ends, but for the advancement of knowledge of papermaking processes and of the engineering and chemical branches of the industry. The superintendents themselves did not need to be convinced of the benefits of getting together for the discussion of common problems and the cultivation of friendly relations among themselves. The idea took like wildfire and soon a healthy and vigorous association was formed, the subsequent history of which is too well known to be recited here.

In the early days of THE PAPER INDUSTRY there was a general awakening of interest in the whys and wherefores of pulp and papermaking methods and processes, with a concentration of effort on means for improving and rendering more systematic the various chemical and engineering branches of papermaking. Along with an eager search for new methods and processes, or improvements to existing methods, there was a general acceleration of intellectual effort and the period was marked by many new inventions applied either in the cooking process, the treatment of pulp and paper, or the machinery involved. All this brought about a great demand for educational material. In the van of the publications, which appealed to readers with engineering articles of a purely educational character, was THE PAPER INDUSTRY, and this characteristic of the journal has been maintained continuously and consistently throughout its existence. The aim has always been to publish articles that were calculated to be of practical use to the men in the mill, long speculative articles on abstruse problems in the chemistry of wood or of cellulose being avoided as inapplicable. The superintendent, engineer or chemist employed in a pulp or paper plant knew that he could always turn to THE PAPER INDUSTRY and be sure to find informative material bearing on the every-day work connected with his job. This is one reason why it is looked for so eagerly from month to month by the men in the mill who know that news articles and reports of ephemeral interest are given a subordinate place, while articles of an educational or instructive character always find a place of honor.

A great deal of space is taken up in this issue with a report of the annual meeting of the American Paper and Pulp Association and its affiliated organizations, such as the Technical Association with its plethora of papers on as many different subjects, all of which have been carefully gleaned and abstracted for our readers. This year's convention of the general association was remarkable for the large attendance at the business meeting, as well as for the character of the subjects discussed. It is unusual to have a nationally known chemist discourse on the botanical and chemical aspects of wood in relation to cellulose, and have him followed by a member of the Federal Trade Commission in the discussion of trade practices. It is not so long ago that chemists and their speculations were given short shrift at a meeting of papermakers, while as to members of the Federal Trade Commission they were merely obnoxious in the sight of organized business men. But all of that feeling of unfriendliness and distrust has been changed since THE PAPER INDUSTRY was started, and that it is so is a sign of the new order of things that prevail.

We learn that all branches of the industry have indicated their satisfaction with the recent convention in letters to the secretary. Approval has also been expressed of this year's banquet program which has set a new high mark to shoot at. It is no light task to provide a banquet program capable of holding the attention of members after a long, trying week of conferences, meetings and social affairs, such as characterized the fifty-second annual meeting of the American Paper and Pulp Association.

Major Porter and his staff of workers are clearly to be congratulated on the success of the convention. The association itself is to be felicitated upon the election of S. L. Willson as its president. Mr. Willson is well and favorably known throughout the country and to all in the industry as a sound business man thoroughly familiar with the conduct of great enterprises from the time he was connected with a large firm of paper merchants in St. Louis, through his services to the country in war as chairman of the Paper Section of the War Industries Board, down to his present skillful management of the American Writing Paper Company, of which he is also president.

Approved!!

By American Coating and Paper Mills

"An American Coating Clay"

(American Made for American Trade)

H. T. BRAND ← Coating Clay

Highest Grade Filling Clay

Technical service available both for coating and loading without charge.

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Edgar Clays are the result of almost half a century of experience in washing clay.

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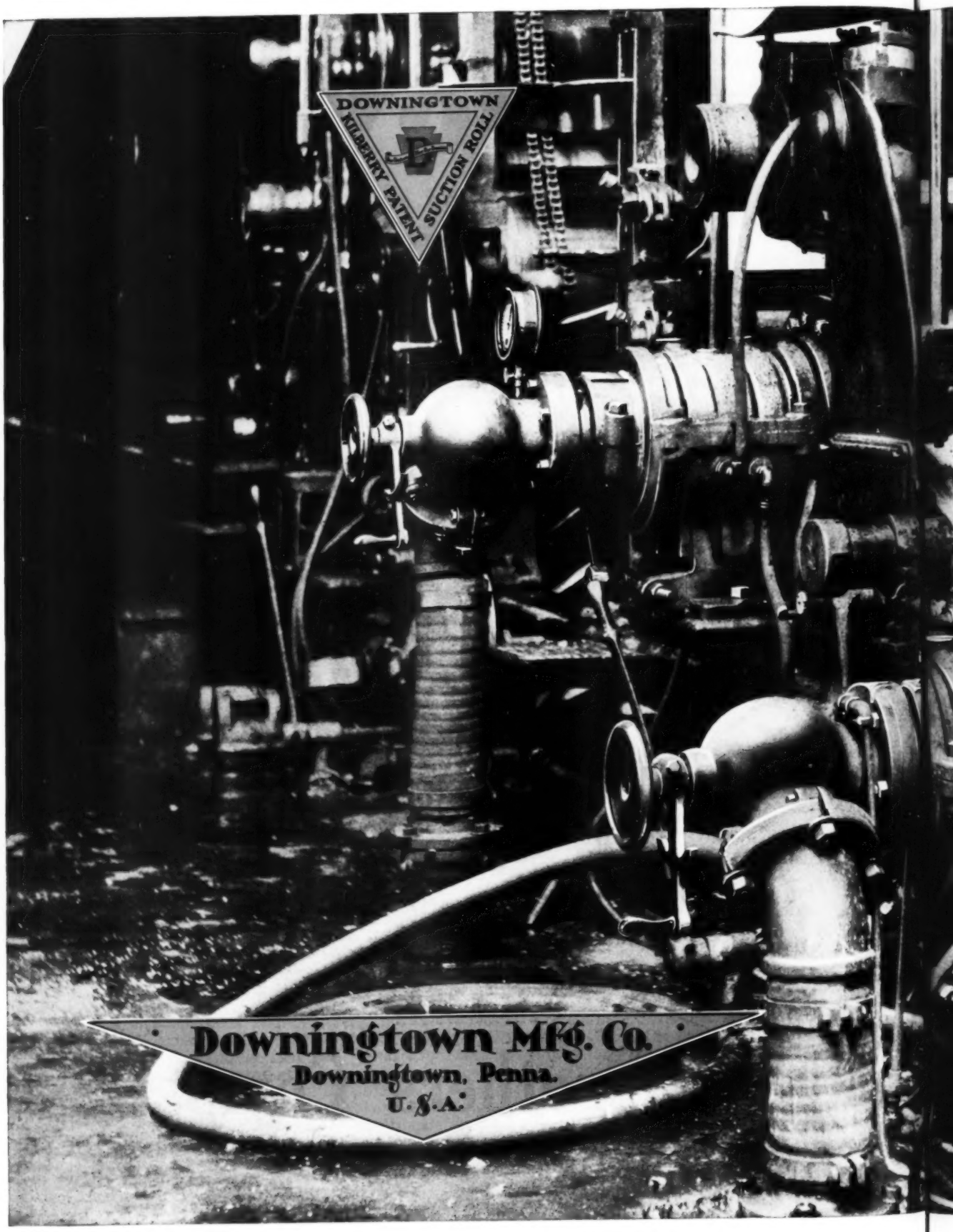
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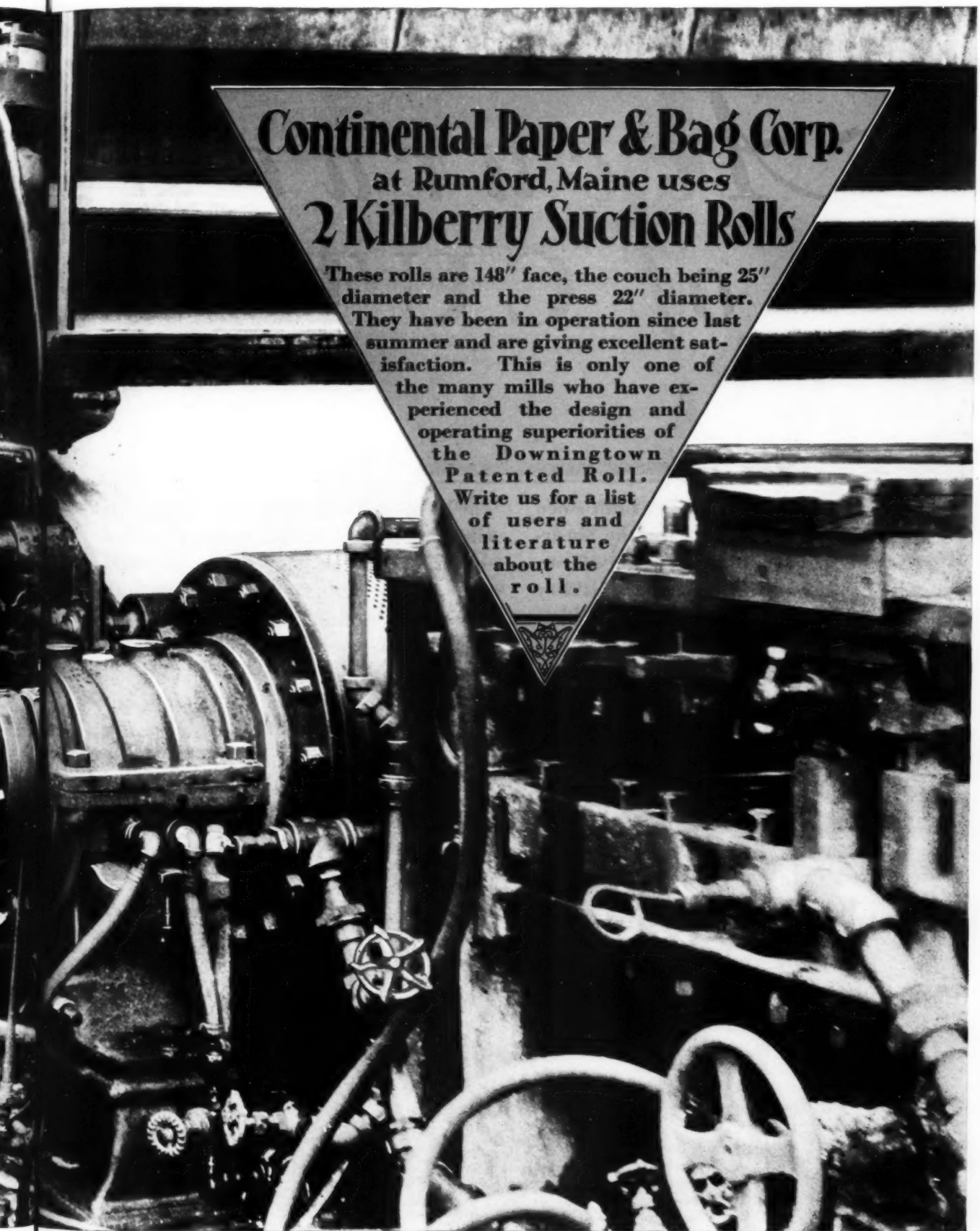
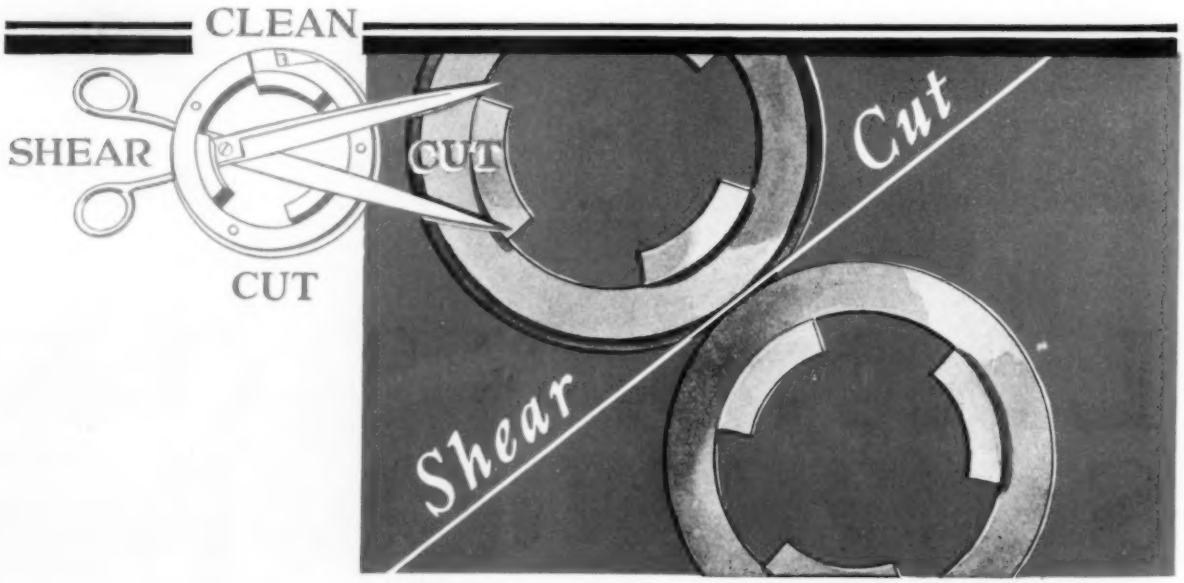

Continental Paper & Bag Corp.
at Rumford, Maine uses
2 Kilberry Suction Rolls
These rolls are 148" face, the couch being 25" diameter and the press 22" diameter. They have been in operation since last summer and are giving excellent satisfaction. This is only one of the many mills who have experienced the design and operating superiorities of the Downingtown Patented Roll. Write us for a list of users and literature about the roll.

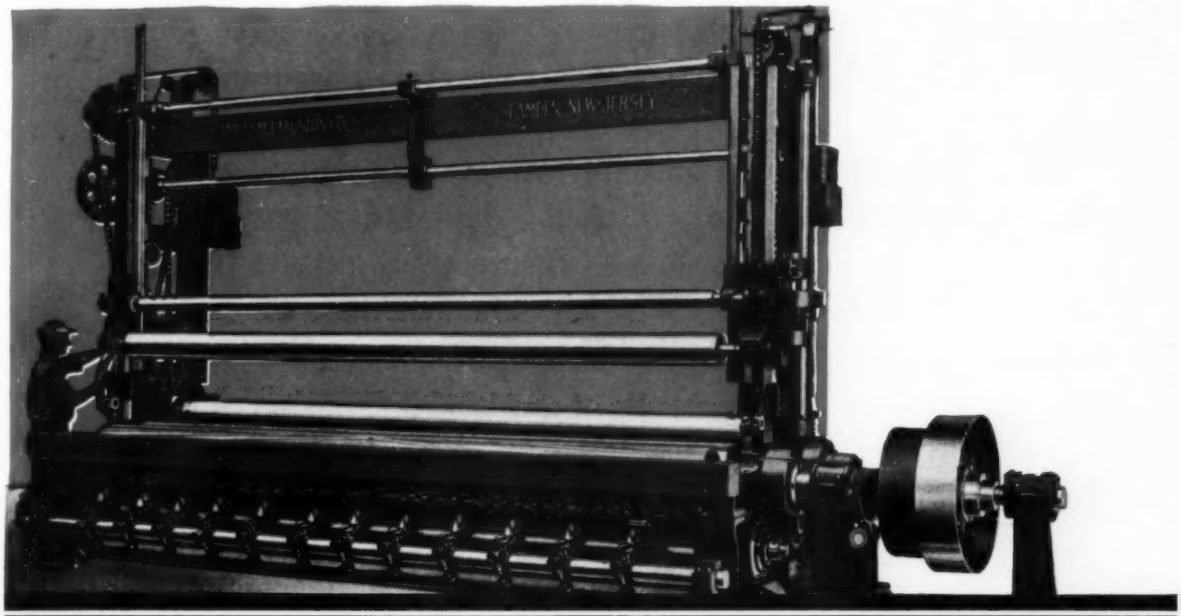
LANGSTON *Accuracy of* CUT

EVERY Langston Slitter built since 1902 has operated on the Shear-Cut principle, consisting of two rotary cutter blades arranged so that they slightly overlap. It will be evident that the cut made by these two blades is really the same as that made by a pair of shears. The edge is sharp and distinct. The paper is cut—*not ground apart.* The rolls made on a Langston Slitter are therefore free from dust.

The Robert Gair Company selected Langston Slitters for their Montville, Connecticut, plant *because they operate on this shear-cut principle.* Dust on the rolls would cause trouble in subsequent manufacturing processes. In the making of corrugated boxes, for example, this dust settles in the silicate tanks, tending to interfere with the regulation of the silicate.

Maintenance on the Shear-Cutters is





slight. The top cutters on the Gair installation are reground but once a month, after handling 2000 tons of paper. The bottom cutters are ground once in three months, after handling 6000 tons of paper. The generally satisfactory operation of the Langston Slitter at the Montville plant is shown by the fact that Langston Slitters have since been installed at other divisions of the Robert Gair Company. The Langston Shear-Cut is a continuous, positive cut. The set-up is easy. Wear is distributed over a flat surface, minimizing sharpening and replacement costs. Langston Slitters embody features which enable the user to derive even greater benefit from their fundamentally correct principles. A catalog is yours for the asking—may we send it?

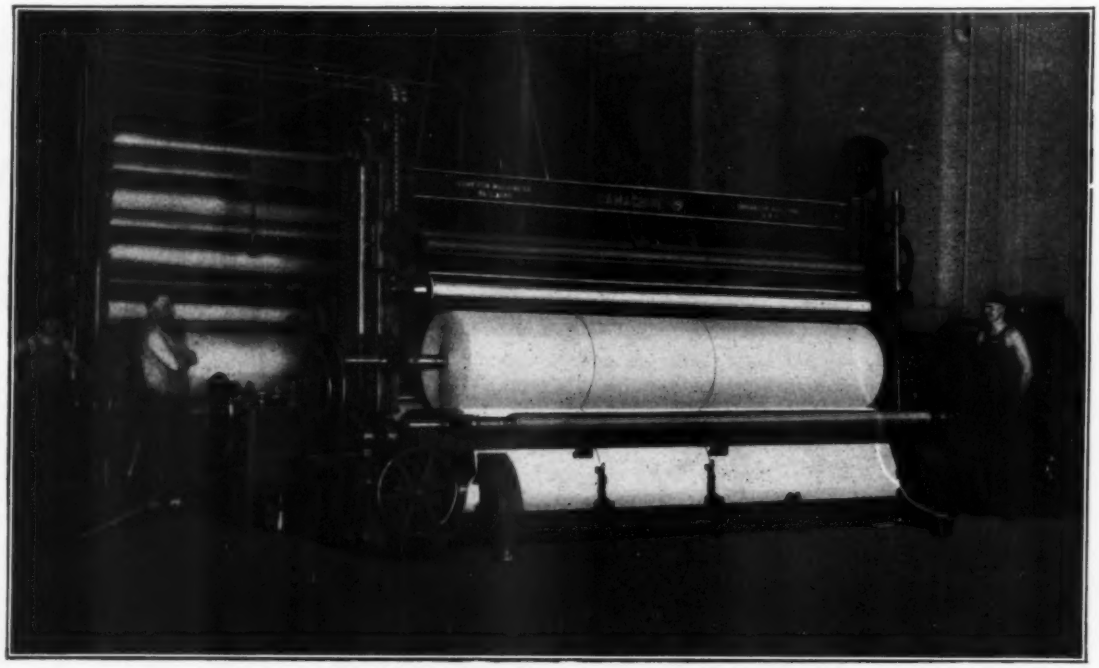
SAMUEL M. LANGSTON COMPANY
CAMDEN, NEW JERSEY
A. H. Cox and Company, Seattle, Washington

LANGSTON SLITTERS

Rolls made on CAMACHINES are clean and accurately cut, firmly wound and of even density from core to outside. The Camachine slitting method insures the accurate cutting; the Camachine winding method the firm, hard rolls. CAMACHINES' speed keeps them safely ahead of the fastest paper machines. Whether winding right off the end of paper machines or in the finishing room, CAMACHINES assure production of *good* rolls of any kind and quality of paper or board. To any mill interested in the production of good rolls, our literature will be of unusual interest. A brief letter indicating your requirements will bring it to you by return mail.

CAMERON MACHINE COMPANY

61 Poplar Street · · Brooklyn, New York



CAMACHINE 19 in action in a modern Paper Mill

The First 100 Years are the Hardest!

We're 92 years *young*—and looking *forward.*

WHAT'S THE ANSWER in the paper business?

Not fewer mills, but better mills . . . with up-to-date machines that cut the cost of making paper by saving time, labor, power, wastage, and producing better sheets.

Old mill machinery can be made young again. There's a lot of service and profit in the old paper machine . . . keyed up to modern mill requirements.

We improve, redesign, rebuild this equipment. We maintain a large Engineering Department, backed by 92 years' experience in Paper Making Machinery.

Let us make a survey for you. We can send experienced engineers to your mill and make specific recommendations for your consideration.

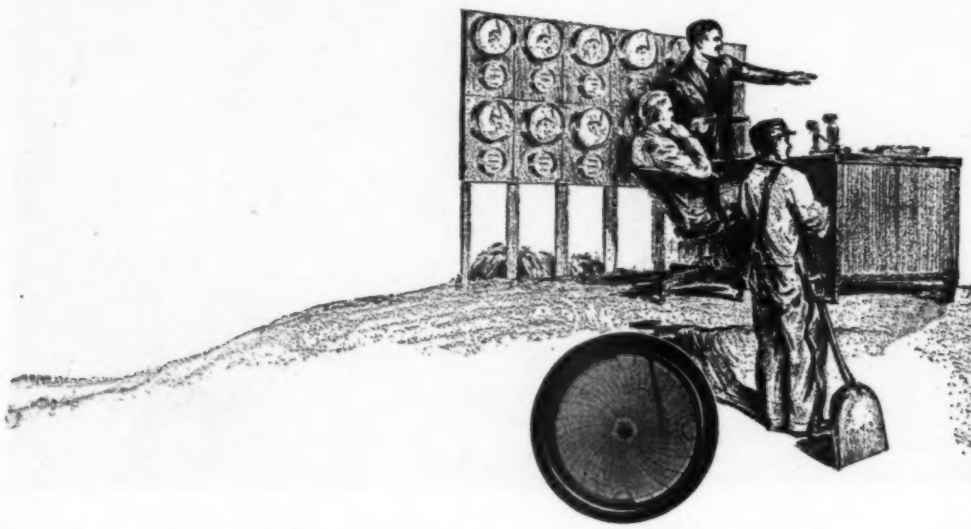
This report may mean more profit for you.

RICE BARTON & FALES INC.
WORCESTER MASSACHUSETTS

100 years of service in 1937

PAPER MAKING *Machinery*

Get The Hilltop V



YOU as a successful manager know that the most important factor in industrial management is an accurate knowledge and control of the costs of each unit of production.

Your ability to operate economically and efficiently each department, both individually and collectively, is what counts. Are your efforts in behalf of lower production costs being impeded by a lack of operating data? Data such as steam consumed by each department and other facts which cannot be gained through mere observation?

Can you, with the information available, obtain a hilltop view of the flow of production in your plant? A Republic engineer will be glad to explain how this can be accomplished through the use of flow meters.

Bulletin "Steam Economy" mailed on request

REPUBLIC FLOW METERS COMPANY

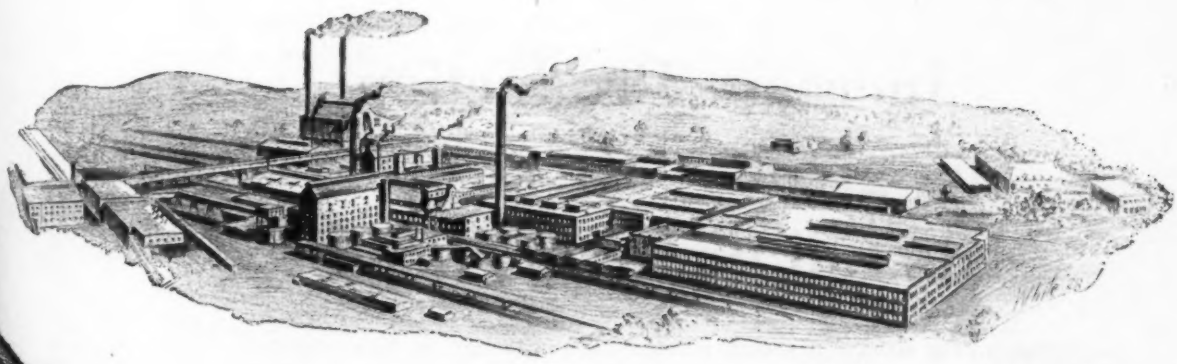
Executive Offices and Plant • 2210 Diversey Parkway • Chicago, Ill.

Branch Offices in 25 Principal Cities

DOMINION FLOW METERS CO., *Toronto, Canada* ELEKTROFLO, *Berlin, Germany* ELECTROFLO METERS CO., *London, England*

The REPUBLIC F

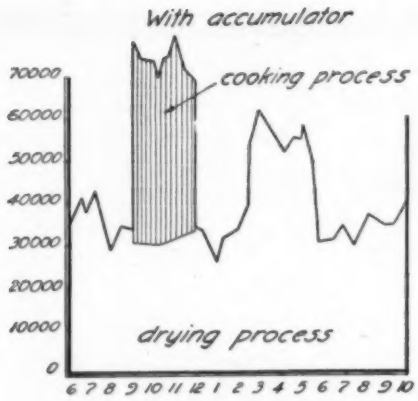
View of Production



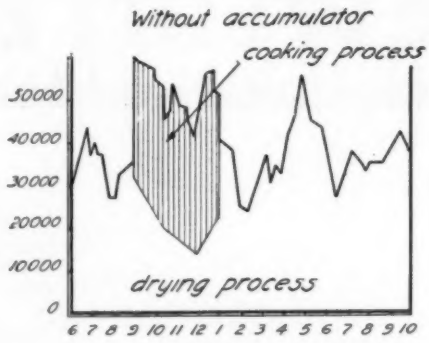
View of Champion Fibre Company, Canton, N. C., where 15 Republic Meters aid in reducing production costs.

REPUBLIC—ORIGINATORS OF THE ELECTRICALLY OPERATED FLOW METER

FLOW METERS



Actual Steam Demand Fully Met
by Steam Storage System



Steam Demand Not Fully Met
Due to Boiler House Limitations

Increase Production by giving each process its full quota of steam

Supplying sufficient steam for the digesters may be delaying the operation of the paper machines, which means less production than if enough steam were always promptly available, regardless of peaks.

Ruths Steam Storage system supplies steam enough for any peak —without forcing the boilers. Operating pressures are absolutely constant—the boilers are fired at a constant rate.

The results include increased production with shorter periods for heating up, lower fuel consumption, decreased boiler maintenance.

Steam storage has added profitable production to many paper and pulp mills. We'll be glad to discuss it with you.

3303

RUTHS Steam Storage, Inc.

RUTHS STEAM STORAGE (CANADA) LTD.,
BANK OF HAMILTON BLDG., TORONTO, CANADA

292 Madison Avenue, New York, N. Y.

A Certificate of Quality

Every product of the International Paper Company is certified as to quality. International insures its reputation by jealously guarding its standards of quality and is constantly seeking to improve its products even though they are already leaders in their fields.

With its unparalleled sources of supply, International can and does use economically only the best materials for each grade. These high quality materials are combined by experienced paper makers and made into finished products by up-to-date, efficiently equipped mills. The economy effected through its enormous purchasing powers and equally impressive production enables International to offer its products at prices that are lower than are usually demanded for papers of equal quality.

Leading, among the forty grades of paper made by the International Paper Company are the following:

Book Bond Offset Envelope Tablet Writing Superoto Waxing Coating Hanging Carbonizing Ground-Wood Specialties Newsprint

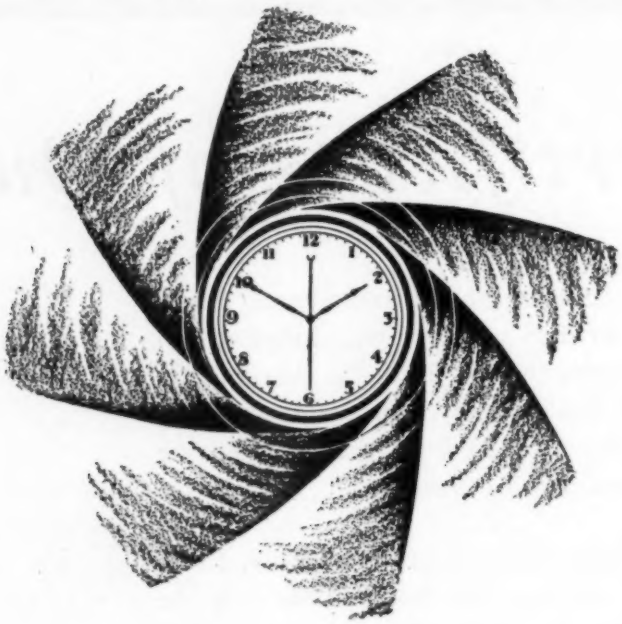
All certified products of

INTERNATIONAL PAPER COMPANY

Main Sales Office: 100 East 42nd St., New York, N. Y.

Branch Sales Offices

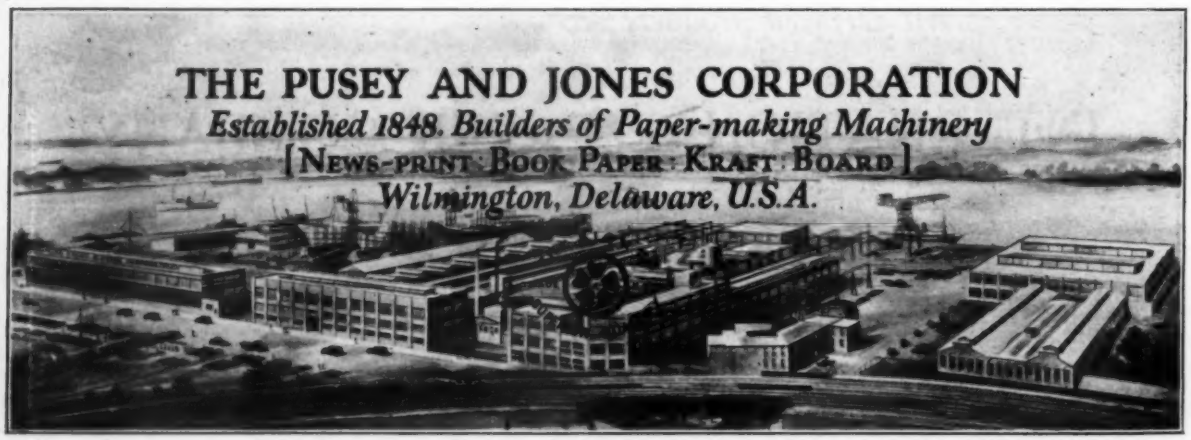
Boston Chicago Atlanta Pittsburgh Philadelphia



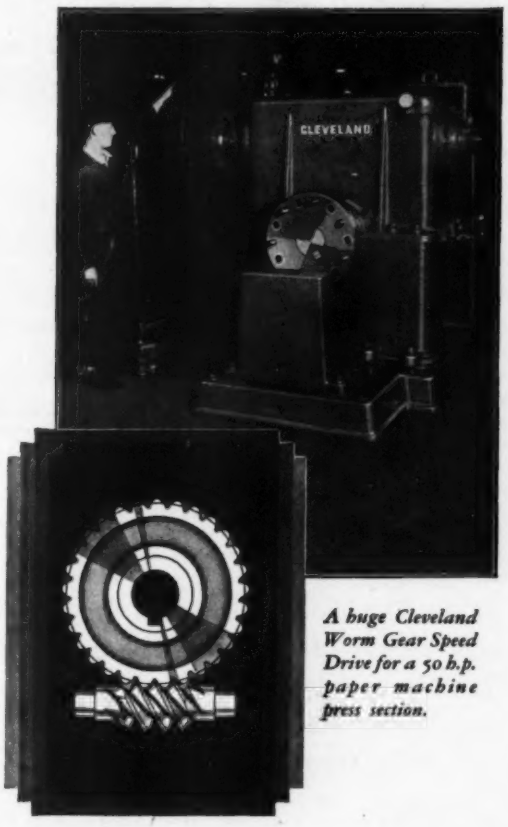
"Split Seconds"

Men may work by the hour and get paid by the week; but in the paper industry it's machines that are the real money-makers. What they can do in a split-second fixes the out-put . . . and the revenue of your plant.

An inch or two wider . . . a foot or two faster . . . and you're miles ahead!


THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-making Machinery
[News-print · Book Paper · Kraft · Board]
Wilmington, Delaware, U.S.A.

Why the remarkable trend to CLEVELAND?



A huge Cleveland Worm Gear Speed Drive for a 50 h.p. paper machine press section.

OTHER speed reduction units are made and sold at lower prices than "Cleveland." Quite obviously, some feature of unquestioned superiority must be responsible for today's remarkable trend to "Cleveland". . . as evidenced by a steadily increasing number of installations and users.

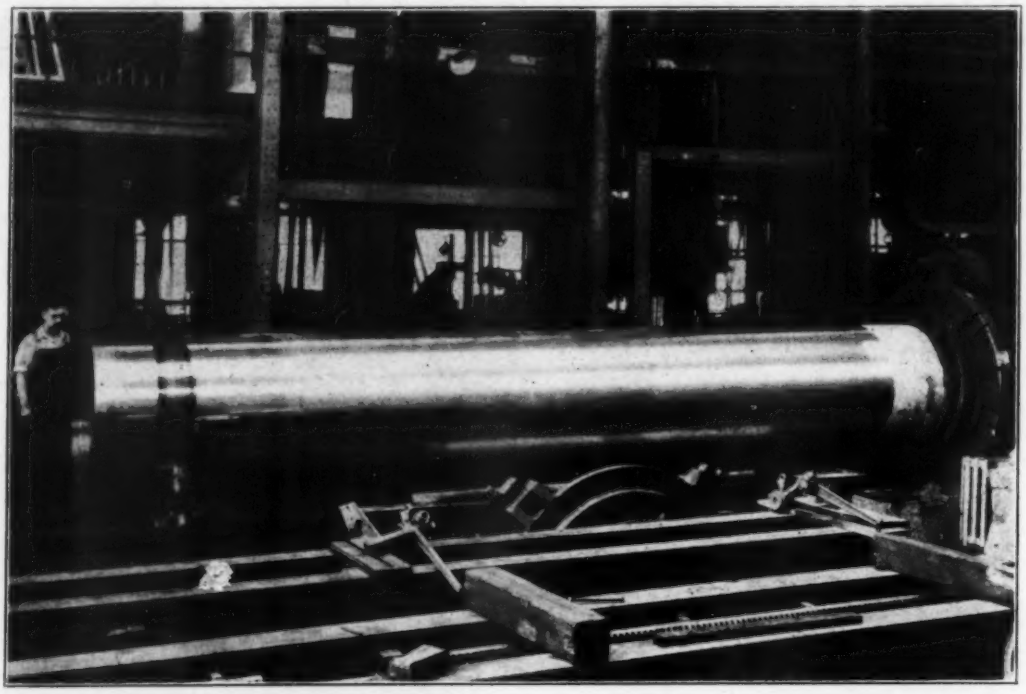
Briefly, it is due to an almost universal recognition among engineers of "Cleveland's" positive refusal to compromise regarding quality.

For "Cleveland" has been the pioneer, always insisting upon that quality which would give unfailing performance and low maintenance costs. Engineers and designers "in the know" turn naturally to "Cleveland" for speed reducers, because "Cleveland" has been the chief source of improved worm gear design for more than fifteen years.

CLEVELAND
WORM & GEAR COMPANY

3270 East 80th Street, Cleveland, Ohio

"CLEVELAND WORM GEARING - THE ULTIMATE DRIVE"



The above illustration shows a 44″ MILLSPAUGH suction couch shell (330″ over all) being turned on the lathe in our shop in preparation for its installation on the 304″ Bagley & Sewall paper machine for the Great Lakes Paper Co., Ltd., Fort Williams, Ontario, Canada. The rough weight of this shell is about 20 tons.

Write for complete information and data on this installation—explaining why MILLSPAUGH rolls are chosen by the leaders of the industry.

Present day competition demands the best in machinery—equip your paper machines with MILLSPAUGH suction rolls

THE PAPER & TEXTILE MACHINERY CO.

Sandusky, Ohio

STATEMENT OF FACTS

For the information of the trade, we desire to state certain facts in connection with our position and policies.

The inventions controlled by this company include a process which is the subject of United States Patent No. 1,163,251, dated December 7, 1915; a Fourdrinier machine embodying a suction couch roll and positive rotary pump which is the subject of United States Patent No. 1,025,822, dated May 7, 1912; and a Fourdrinier machine embodying suction couch and suction press rolls in combination, which is the subject of United States Patent No. 1,163,253, dated December 7, 1915.

Only one of these patents, No. 1,025,822, was litigated in our recent suit against Downingtown Manufacturing Company, and in that suit the patent was found good and valid by the trial court and was held invalid by the United States Circuit Court of Appeals for the Third Circuit only by a majority decision, while the chief justice of said court of appeals rendered a dissenting opinion. We are advised that the decision in said suit would not be controlling upon United States courts of other circuits in suits against others than the defendant and its privies to the former suit. We shall, therefore, promptly take such measures as may be necessary to maintain and enforce our rights under said patent No. 1,025,822 as well as under the said patents Nos. 1,163,251 and 1,163,253, which have not yet been litigated.

These inventions, which have greatly advanced the paper making art and benefited the industry, were introduced by us at large effort and expense. Our rights under the patents have always been exercised in a manner advantageous to the industry. Prices on equipment have been fair and reasonable. In view of the value of the inventions, we might well have furnished our equipment at substantially higher prices, as has been frankly acknowledged by paper manufacturers. Our plant is largely devoted to the production of apparatus for practicing the inventions. We have invested hundreds of thousands of dollars in plant and development to supply the industry with equipment in accordance with the growing needs of the industry as to sizes and speeds of paper making machines, which progress has largely resulted from the inventions themselves. All fair minded men will therefore realize the importance to us of protecting our investments and inventions, and will recognize the necessity forced upon us for further defending our position. We feel that the benefits of our inventions and our service to the industry justly entitle us to the moral support of the trade in this regard.

WE FURTHER INVITE ATTENTION TO THESE FACTS:

Millspaugh suction couch and press rolls have **stood the test** of long service in the leading mills, with highly successful results.

Millspaugh suction rolls are of practicable type and construction, **built on correct mechanical principles,** strong, durable and reliable.

The desirable feature of **adjusting the suction box to the shell and maintaining the adjustment,** so as to preserve the seal with minimum operating friction, is an original characteristic of the Millspaugh rolls, still incorporated in all types of suction rolls manufactured by us.

Convenient **adjustment** for **changing the angular position of the suction box has always been a feature of the Millspaugh rolls.**

Manufacture of the suction roll shells by the **centrifugal casting process was pioneered and developed** by this company. We are fully equipped for this work in our own plant. Without this invention suction roll development would have been greatly handicapped.

Spiral drilling of the holes in the shell, to avoid scoring the box packings and interior of the shell, **was** likewise **developed and introduced by us.** The spiral drilling is incorporated in our present standard roll, which is the subject of a pending application for patent, with which an application by a party now advertising this feature has been placed in interference by the United States Patent Office.

A small-bearing roll with direct drive, incorporating these features, as in old patents and constructions, was developed by our licensee Dominion Engineering Works, and the same may be furnished by us where preferred to our standard construction.

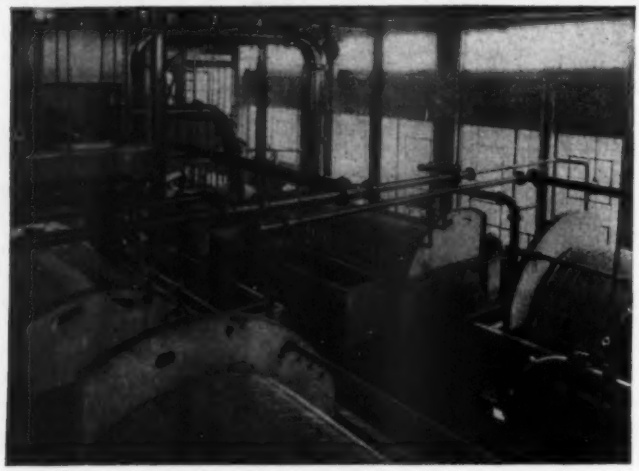
Cantilevered suction rolls were built by us many years ago, and may be furnished where desired in accordance with our developments.

None of these features were involved in the Downingtown Manufacturing Company suit nor have any of them the slightest bearing on that litigation which was confined strictly to Millspaugh Patent No. 1,025,822—Suction Couch Roll with Positive Rotary Pump in a Fourdrinier Machine.

The Paper & Textile Machinery Company and its predecessor company, The Sandusky Foundry & Machine Company are and always have been pioneers, spending many hundreds of thousands of dollars in the past in its developments for the paper industry and is now spending several hundred thousand more building a model development paper mill for demonstrating new inventions by staff engineers of the Company and those of others with whom we are affiliated in the industry.

THE PAPER & TEXTILE MACHINERY COMPANY

Sandusky, Ohio.



Kraft Pulp Washing at its Best

---Union Bag & Paper Power Corporation Thus Makes Use of Five Oliver Washers

Some 450 Oliver United Units Are Now in Use in Paper and Pulp Mills

Deckers after Screening
Save-Alls
High Density before Bleaching
Bleach Washers
Decker Save-All Units
Brown Stock Washers and Re-washers
Lime Mud Washers
Wet Machine Moulds
Board Forming Moulds

IN the new Tacoma Mill of the Union Bag & Paper Power Corporation, five Oliver Continuous Filters are handling the entire kraft washing for this modern 150 ton plant. Installed to handle the proposed mill output, they will easily handle a greater tonnage should the production be stepped up even higher.

Three of these five Oliver Brown Stock Washers (6′ x 10′ units) take the pulp direct from the digesters and send black liquor to the evaporators. From this angle, the minimum dilution as provided by Olivers is a distinct advantage.

The other two units (8′ x 10′) handle the re-washing and at the same time act as save-alls. By removing the final traces of black liquor, these units are instrumental in eliminating foaming on the screens.

It is significant that in this modern plant, Oliver Brown Stock Washers were selected for the important duty of delivering clean, thoroughly washed pulp.

OLIVER UNITED FILTERS INC.

Successors to Oliver Continuous Filter Co., and United Filters Corporation

SAN FRANCISCO, Federal Reserve Bank Building NEW YORK, 33 West 42nd St.
SALT LAKE CITY, Felt Building CHICAGO, 565 W. Washington Blvd.
LOS ANGELES, Central Building PARIS, 63 Ave. des Champs Elysees
LONDON, 150 Southampton Row, W. C. 1

Johannesburg Tokyo Melbourne Manila Honolulu Montreal
Halle, Germany Scheveningen, Holland Soerabaia, Java

Factories: Hazleton, Pa. Oakland, California
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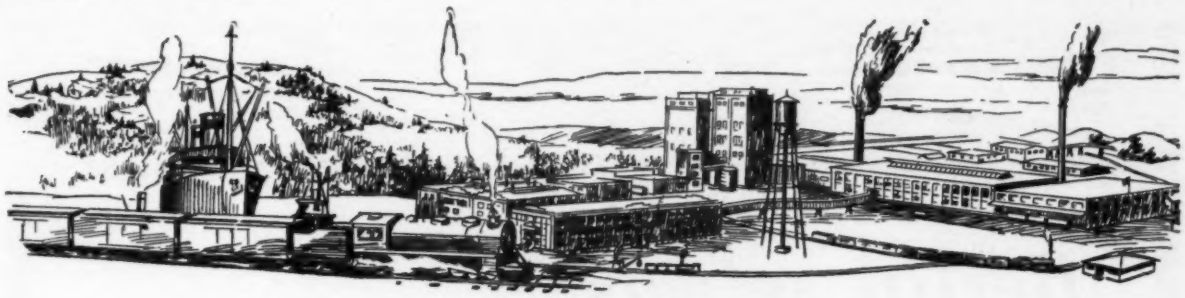

A national business ... *nationally handled*

WHERE wood exists in steady volume best quality and at lowest costs—there you will find a Union or affiliated *Pulp Mill.* Where freight-rates are most encouraging, skilled labor assured, quality up and costs down—there you'll find a Union or affiliated *Paper Mill.*

Where the supply of the correct bag-paper is best and at lowest costs, where carriage to trade-centers is quickest and cheapest—there you will find a *Union Bag Factory.*

Where business concentrates—there you will find a *Union Warehouse;* stocked by frequent factory shipments, constantly checked by experts for turnover and for completeness.

Where wholesale houses require the co-operation of a man skilled in every phase of coarse paper and paper bags—there you will find a resident *Union Sales Representative* ... of an efficiency that has become a watchword.

Not haphazard or by accident, but all arranged deliberately and with foresight. Not merely around New York or Boston or Chicago, but *nationally* ... between the two oceans and from Canada to Mexico.

These are unquestionably the reasons why, among wholesale paper merchants, it is regarded as a real distinction to become a part of the Union Sales Organization ... and to secure the benefits of a *national* connection.

A HUMBLE member of the society of staples—a Union Paper Bag—but it can be the means to a steady, profitable line of business.

UNION BAG & PAPER CORPORATION

Manufacturers of Wrapping Paper, Paper Bags & Paper Sacks

GENERAL OFFICES • WOOLWORTH BUILDING • NEW YORK, N. Y.

A-E-CO
TAYLOR STOKERS
JURUICK REFRIGERATION — LO-HED HOISTS — MARINE AUXILIARIES

Berlin selects
TAYLOR STOKERS
for big new West Central Station

EIGHT . . . Ultra-modern giant stokers for the capital of Germany . . . 600,000 pounds steam capacity each . . 20 retorts wide and 49 tuyeres deep . . . individual control of coal pushers at every part of the fuelbed . . . preheat 500° F. or more . . . A-E-CO Furnace Armor . . . new straight-line drive . . . ash pockets of improved design . . . the last word in economical coal-burning equipment.

Other big European jobs recently completed and now operating . . . Deptford East central station, one of the most important units in London's new power system . . . Milan Edison Company's new Genoa central station in the busy industrial section of Northern Italy.

Send for copy of "Development and Recent Design of Stoker-fired Equipment"

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In Great Britain: Taylor Stoker Company, Ltd.
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AMERICAN ENGINEERING COMPANY, 2409 Aramingo Ave., Philadelphia, Pa.
Gentlemen: Please send me a copy of "Development and Recent Design of Stoker-fired Equipment."
Name — Please print it ..... *Title* .....
Company .....
Street Address ..... *City* ..... *State* .....

You'll find this HELPFUL

send the coupon for yours

THIS new booklet contains, in addition to a complete description of the Edge Moor Cross Drum Boiler, much other information of interest to power plant owners and engineers.

Included are representative installations showing arrangement of boiler and furnace equipment for various fuels and operating conditions; typical layout of modern boiler room, and suggestions for care of power boilers, reprinted by special permission from Section VII of the A. S. M. E. Boiler Code.

A large number of illustrations, chiefly from photographs, combine with non-technical text to make easy and interesting reading.

Fill out the coupon below, mail it, and your copy will be promptly sent—without obligation, of course.

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Established 1868
EDGE MOOR, DELAWARE
New York *Chicago* *Boston* *Los Angeles*
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EDGE MOOR Water Tube BOILERS

STRAIGHT AND BENT TUBE TYPES—WATER WALLS—AIR PREHEATERS

EDGE MOOR IRON CO.
Edge Moor, Delaware

(Date) .....

Please send me a copy of your booklet, "The Edge Moor Cross Drum Boiler."

Name..... *Position*.....

Company.....

Street.....

City..... *State*.....

We operate..... *boilers totalling*..... *rated h. p.*

At Passaic, Modena, and Edgely

RICHARDSON AUTOMATIC COAL SCALES

keep accurate records of coal burned by each boiler. Typical of how Richardson Apron Feed Scales win hearty approval and earn repeat orders, are their records with the Paterson Parchment Paper Company.

A close check on coal consumption enables the management to obtain maximum production from each pound of fuel; likewise to at once detect and correct any overconsumption of any boiler through dirty tubes, holes in fire, improper baffling, leaks, etc.

Some of the 8 Scales installed at Modena.

A few users:

Brown Company, Berlin, N. H.	12
Champion Coated Paper Co.	11
Champion Fibre Co.	5
Gardner-Harvey Co.	10
Mac-Sim-Bar Paper Co.	6
W. Va. Pulp & Paper Co.	14
Warren Mfg. Co.	6
Arrowhead Mills, Inc.	4
Bogalusa Paper & Board Co.	4
Kimberly-Clark Company	8
Paterson Parchment Paper Co.	16

And in Canada

Price Bros., Ltd.	3
Ste. Anne Paper Co.	3
Anglo-Canadian Pulp & Paper Co.	1
Spruce Falls Power & Paper Co.	4

RICHARDSON Coal Scales are accurate and reliable and furnish continuous records of fuel consumption for each hour, shift or day.

Install them on **your** boilers and **weigh** the coal going to each stoker or pulverizer and thus be certain that each is "doing its bit" and operating at maximum efficiency.

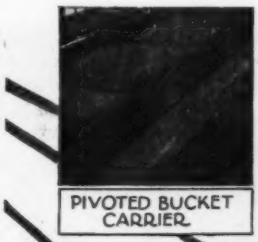
Our Bulletin 1224-GP fully describes and illustrates the modern method of Boiler Room Control. Let us send you a copy.

RICHARDSON SCALE COMPANY

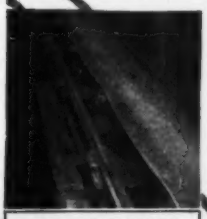
CLIFTON, NEW JERSEY

Chicago New York Pittsburgh Philadelphia
Omaha Wichita Minneapolis
Atlanta Los Angeles Gulfport

Jeffrey Engineers Are *NOT COMMITTED* to Any Type of Coal or Ashes Handling Equipment


PIVOTED BUCKET CARRIER

V-BUCKET CONVEYOR


BELT CONVEYOR

BUCKET ELEVATOR

SPIRAL CONVEYOR

SCRAPER CONVEYOR

DRAG CHAIN

SKIP HOIST

NO single unit can successfully meet all coal and ashes handling needs. For this reason, Jeffrey makes many types of coal and ashes handling equipment. Each type has been proved efficient by years of economical service.

In submitting recommendations Jeffrey Engineers, therefore, feel free to select only the type of equipment best suited to each local requirement.

We want you to avail yourself of the accumulated experience of Jeffrey Engineers in planning coal and ashes handling installations. When would you like to talk to one of them?

Catalogs sent on request

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New York	Philadelphia	Chicago	Cleveland	Atlanta
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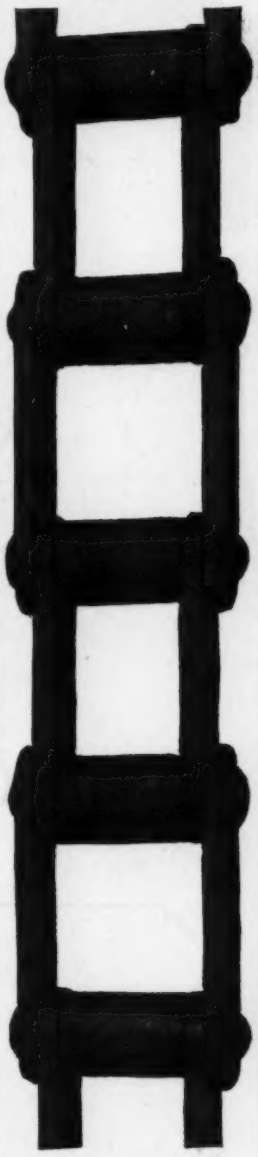
Utica	Charleston, W. Va.	Milwaukee	Salt Lake City	Boston

Jeffrey Manufacturing Co., Ltd. Montreal Toronto

Jeffrey Chains for Every Service



Jeffrey Hercules Chain for drives and rough service handling pulpwood, coal, etc.

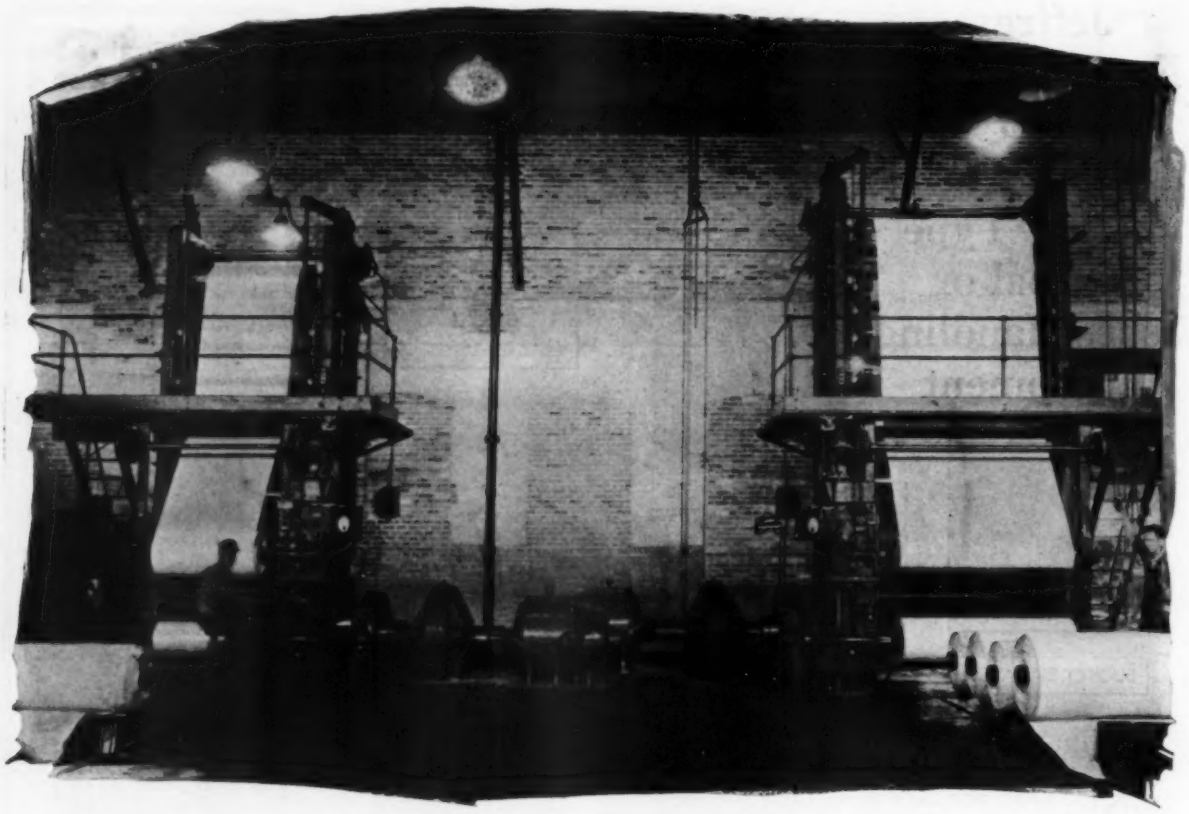
52 YEARS OF SERVICE TO INDUSTRY

JEFFREY

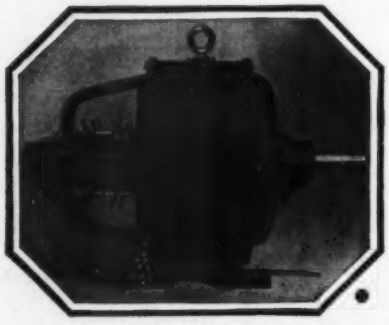
MATERIAL HANDLING EQUIPMENT

Jeffrey Products for Pulp & Paper Mills

Elevators
Conveyors
Portable Loaders
Coal and Ashes Handling Equipment
Skip Hoists
Chains and Attachments
Sprocket Wheels—Gears
Crushers—Pulverizers
Locomotives
Ventilation Fans



For Calender Drives
Come to Reliance



Reliance Engineers have been actively identified with the development of motor-drives which have brought increased production and lower costs on many kinds of paper mill work. Why not make use of this experience which is available for solving similar problems in your mills.

Here are the main features of Reliance Motor-drives for calenders that mean lower costs and improved quality.

1. Simple and efficient driving parts.
2. Speed adjustments over the required range.
3. Smooth acceleration.
4. Low threading-in speed.
5. Quick stopping by dynamic braking.
6. Easy and convenient control of all operations.

We shall be glad to show you in detail how these features will help you keep in step with the demands for cost reduction. Feel free to call on us without obligation.

RELIANCE ELECTRIC & ENGINEERING COMPANY
1058 Ivanhoe Road, Cleveland, O.

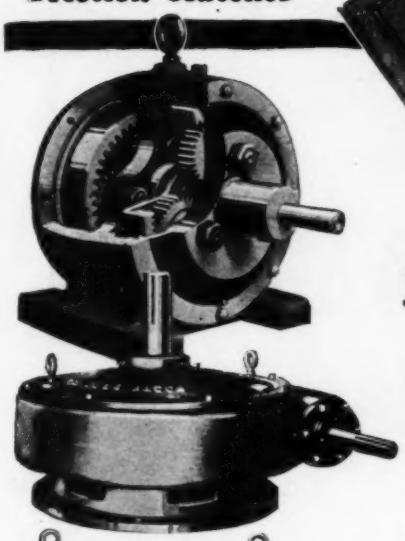
Branches: Birmingham, Boston, Buffalo, Chicago, Cincinnati, Detroit, New York, Philadelphia, Pittsburgh, St. Louis

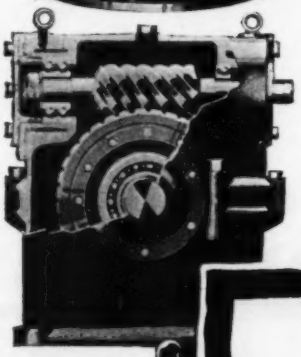
RELIANCE A-C D-C MOTORS

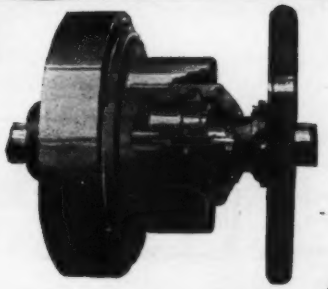
IXL Speed Reducers to meet all your needs

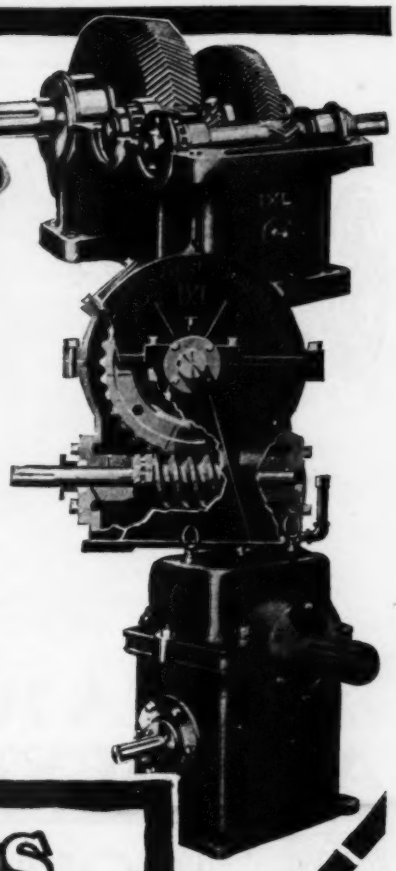
Flexible Couplings
Friction Clutches

IXL Transmission Equipment
Gears of all Kinds









SEND for your copy of "Gear Problems" if you have not already received one.

661 pages of data and information on all types of speed reducers and gears for use in every industry.

Contains over 200 pages of valuable Reference Tables — Data — Formula and Problems.

Our engineering department is always at your service, to help solve and plan unusual problems involving speed reduction or gears, without any obligation.

FOOTE BROS. GEAR & MACHINE CO.

237 No. Curtis St., Chicago

Sales and Engineering Offices in all Principal Cities. U. S. A and Canada

P. I. 283

FOOTE BROS. GEAR & MACHINE CO
240-250 N. Curtis Street
CHICAGO. ILL.

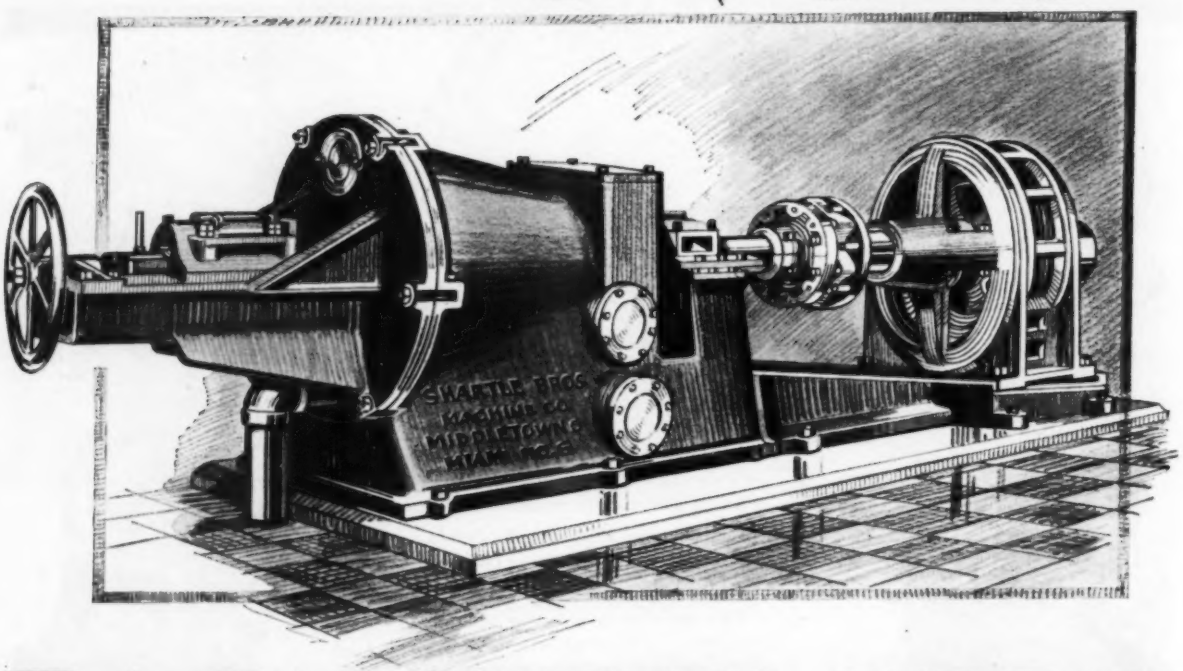
Send me a copy of "Gear Problems"

Signed_____

Address_____

3-29

Miami No. 6



A FAR BETTER JORDAN AND SEVERAL REASONS WHY

ON the No. 6 Miami Jordan we have increased the shaft diameter 28% AND AT THE SAME TIME DECREASED THE BEARING CENTER 38%. Read that again. THINK what that means —Bigger Shaft and shorter bearing centers.

The answer, of course, is RIGIDITY, and if there is one thing you MUST HAVE in a jordan it is RIGIDITY. It is the difference between success and failure. It is ONE outstanding reason why No. 6 jordans are doing better work cheaper. The No. 6 is unquestionably the best jordan we have ever built.

The adoption of Timken Tapered Roller Bearings represents another high point of No. 6 construction—helps maintain perfect alignment of shaft and shell—makes the unit run far easier and smoother—adds extra years of service to the job.

Other features that help to make the No. 6 a better jordan? Glad to go over them with you.

SHARTLE BROTHERS

DIVISION OF THE BLACK-CLAWSON COMPANY

Middletown, Ohio

69%

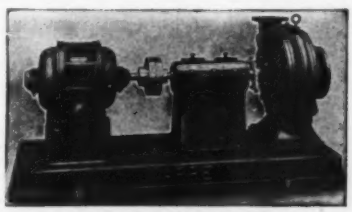
in the pulp and paper industry

repeat orders for Warren Pumps

in 5 years

97 pumps in one mill, 65 in another, several with installations of 20 to 45 and a great number of mills with 2 to 15,—each started with one or two Warren Pumps. The economical operation of the pumps in actual service, maintenance of their original efficiencies over a long period of time and their steady, dependable operation have resulted in more than 69% repeat orders . . . . proof that the pumps are built to live up to the claims made for them.

Designed by engineers thoroughly familiar with pulp and paper mill pumping conditions, Warren Pumps contain many important advantages not found in ordinary pumps . . . give the user the lowest possible pumping cost per year. Write for Bulletins covering the services in which you are interested.



WARREN STUFF PUMP

Warren

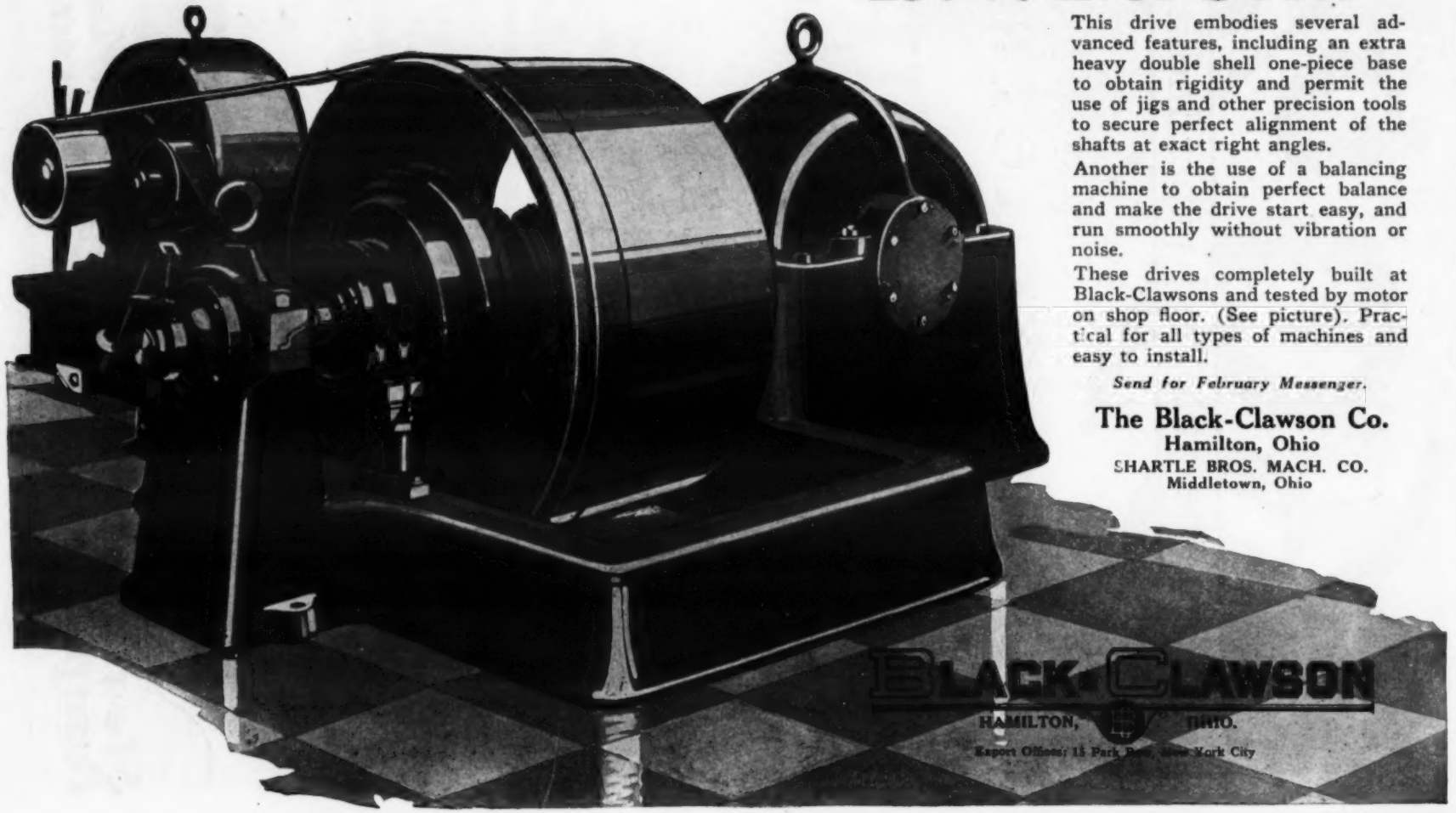
Steam Pump Company Inc. — **Warren Massachusetts**

Agencies in principal cities.

2716

B-C Spiral Bevel Gear Drive

Several Steps Ahead of Anything You've Ever Seen



This drive embodies several advanced features, including an extra heavy double shell one-piece base to obtain rigidity and permit the use of jigs and other precision tools to secure perfect alignment of the shafts at exact right angles.

Another is the use of a balancing machine to obtain perfect balance and make the drive start easy, and run smoothly without vibration or noise.

These drives completely built at Black-Clawsons and tested by motor on shop floor. (See picture). Practical for all types of machines and easy to install.

Send for February Messenger.

The Black-Clawson Co.
Hamilton, Ohio
SHARTLE BROS. MACH. CO.
Middletown, Ohio

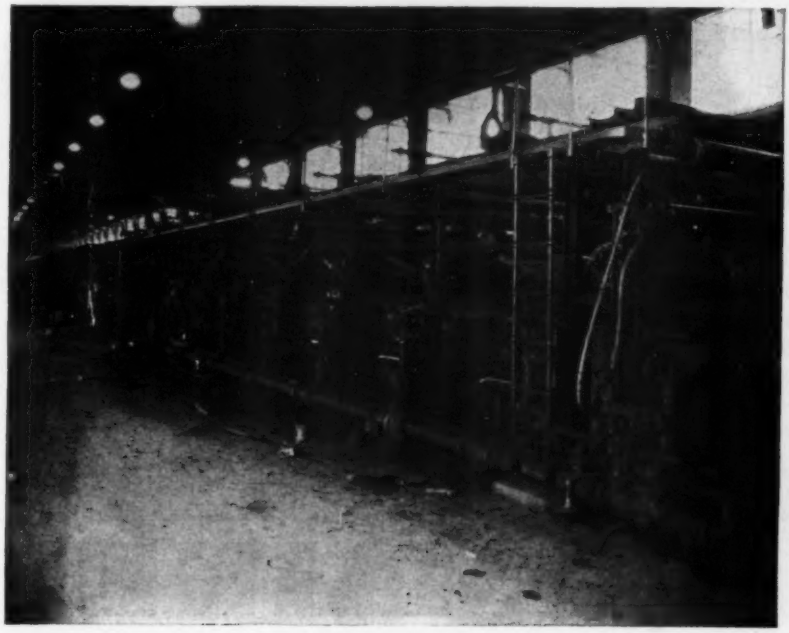


Photo shows a new 7 cylinder 132" board machine in a modern mill in the Middle West. This machine is equipped with 7 Goodrich Vulcalock couch rolls.

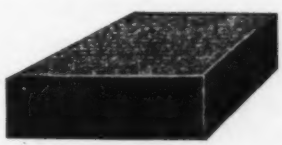
Far greater resistance to edge wear in these couch rolls

THE VULCALOCK couch roll is much tougher and has far superior resistance to edge wear than the ordinary couch roll because of the special process by which it is made.

This process—the Vulcalock Process—is an exclusive technique, developed by Goodrich, of joining rubber to metal by an inseparable bond — a bond as strong as the rubber itself. An adhesion of 500 pounds to the square inch is produced by the Vulcalock Process.

As a result, Vulcalock couch rolls are made without a hard rubber base and it is possible to effect a cure which gives a uniformly soft density to the entire cover, right to the metal core.

The rubber cover of a Vulcalock couch roll can be used until the rubber is worn down close to the core.



Aeroboard head box linings protect quality of the paper

Superior to African mahogany, cypress or other wood lining because Aeroboard does not accumulate slime and dirt. "Slugs" and imperfections in the sheet are substantially reduced. Head boxes lined with Aeroboard can be quickly hosed out while felts are being washed. Any good millwright can apply Aeroboard in your own plant by following our easy instructions. The box can be made absolutely waterproof. Send for details.

Check List of Goodrich Products used in the Paper Industry: Vulcalock couch, worm, and press rolls ✓ Highflex belting ✓ Rubber lined pipe and fittings ✓ Fire, water, air and steam hose ✓ Cutless rubber bearings, rubber lined tanks, screen diaphragms, gaskets, packing ✓ Flexite buckets and dippers.

Many prominent mills have already discovered the remarkable economy and efficiency of Vulcalock couch rolls and are ordering them to supplant old-type rubber rolls, as well as felt rolls. Vulcalock rolls will pay for themselves against any other type of roll made.

Vulcalock couch rolls may now be obtained with rubber attached by the Vulcalock Process to an aluminum core. Weight of aluminum couch rolls is two thirds less than rolls made with cast iron core. Aluminum couch rolls are especially adapted to cylinder machines making tissue.

We will gladly send additional information. Write to The B. F. GoodrichRubber Co., Akron, O., or in the West, Pacific Goodrich Rubber Co., Los Angeles, Cal., or fill in the coupon below.

Goodrich

THE B. F. GOODRICH RUBBER CO., Akron, Ohio
(*In the West, Pacific Goodrich Rubber Co., Los Angeles, Cal.*)

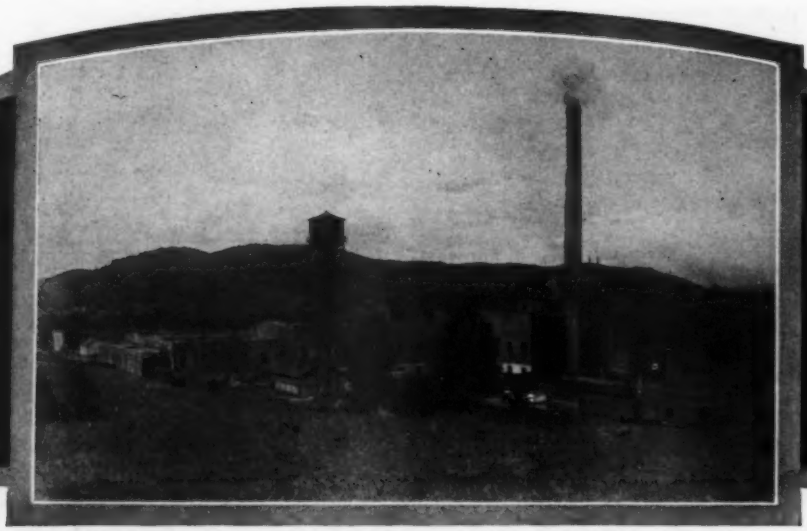
Gentlemen: Please send, without obligation to me, a sample section of Aeroboard and data on its application to head box lining.

Name.....

Firm.....

Address.....

PI-3



IN MAINE

FRAZER PAPER LTD. has developed, at Madawaska, Maine, what is undoubtedly one of the most modern paper mills in the world.

Its tremendous daily production of over 800,000 lbs. of fine Sulphite Specialties, Bonds, Ledgers, Boards, Bristols, etc. is made possible through the use of equipment that is probably the last word in efficiency.

Mid-West High Speed Beaters (twenty-one in all) play a prominent part in maintaining this production.

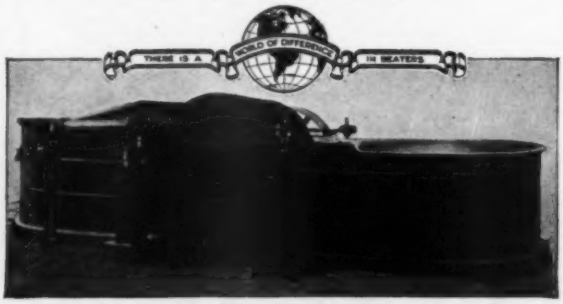
Mid-West Hi-Speed Beaters not only operate economically at heavy densities, but produce the exacting and uniform results that are of such great importance to *men who know.*

An intelligent comparison will inevitably mean Mid-West High-Speed Beaters.

Write today.

May we submit estimates on the installation of Mid-West Hi-Speed Beaters in your Plant?

THE MID-WEST MACHINE CO.
DAYTON, OHIO



MID-WEST

For Beater Dyeing

WHERE fastness to light is of prime importance, the following National Dyes are particularly recommended:

National Brilliant Paper Yellow C

National Erie Fast Yellow WBP

National Solantine Yellow FFP Conc.

National Croceine Scarlet FP Conc.

National Niagara Sky Blue 6BP
(with copper sulfate)

National Niagara Blue GP Conc.
(with copper sulfate)

You will find it advantageous to consult us about your coloring problems.

National Aniline & Chemical Co., Inc.
40 Rector Street, New York, N. Y.

BOSTON
PROVIDENCE
CHICAGO
CHARLOTTE
TORONTO
PHILADELPHIA
SAN FRANCISCO

NATIONAL DYES

Twin Tanks Installation, Simplex Paper Co., Palmyra, Michigan

BUILD THEM OF TILE

There are so many advantages in using tanks of glazed tile that their popularity is growing rapidly in the paper industry.

Utility: Kalamazoo Glazed Tile is thoroughly practical for Stock Tanks, Stuff Chests, Bleach Stock Tanks, Hot or Cold Water Storage Tanks, and because of its great strength is entirely practical for Agitators.

Cleanliness: Tanks built of Kalamazoo Glazed Tile are easy to clean and are easy to keep clean. A big improvement over wood, concrete or metal.

Permanence: Kalamazoo Glazed Tile blocks are tremendously strong. Made from choice fire clay and burned at 2200°F., they have a fracturing strength of 2000 lbs. per square inch. Steel reinforcing hoops are imbedded in the mortar joints (see sketch below). Blocks are thoroughly glazed. Joints may be litharged where conditions require.

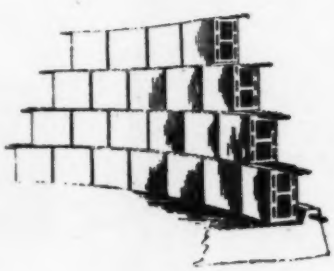
Economy: First cost compares very favorably with wood. Upkeep and replacement cost of Kalamazoo Glazed Tile Tanks is practically negligible.

We cater to the tank needs of the paper industry. Send us your inquiries for wood or tile tanks. We can save you money.

TANK BUILDERS SINCE 1867

Kalamazoo Tank & Silo Co.
Kalamazoo, Michigan

Kalamazoo Glazed Tile



MORRIS
CENTRIFUGAL PUMPS

for heavy pulp

MORRIS Non-clogging Pumps are specially designed to handle pulp and other semi-solids and can be depended upon to give continuous trouble-free operation even in unusually severe service.

All wearing parts are exceptionally heavy, impellers are designed for high efficiency as well as providing ample passages for large solids, and the inside of the pump is readily accessible.

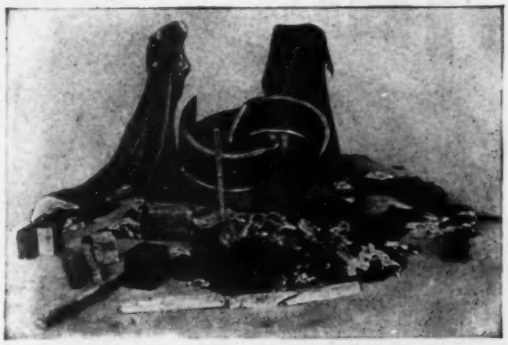
These units are built both vertical and horizontal, in sizes having suction and discharge openings ranging from 3 to 20 in., with impellers 8 to 40 in., for solids 2 to 12 in. maximum dimension, and for maximum capacities of 450 to 16,000 gal. per min.

Send the coupon for full information—without obligation—on how Morris Non-clogging Pumps will handle your pulp speedily, economically, and without danger of interruptions to production.

MORRIS MACHINE WORKS, Baldwinsville, N. Y.

Originators of Centrifugal Pumps, both Single and Multi-Stage, and builders for practically all purposes since 1864.

Branch Offices:—New York, 26 Cortlandt Street; Philadelphia, Witherspoon Building; Cleveland, 1367 E. Sixth St.; Chicago, 217 N. Jefferson Street; Boston, 79 Milk Street; Pittsburgh, 320 Second Avenue; Detroit, Fisher Building; Charlotte, N. C., Realty Building.



The surprising ability of the Morris Non-clogging Pump to pass large solids is indicated in the above picture of the impeller of a 10-in. pump and the material it passed in a shop test—rags, pairs of overalls, 4 in. x 4 in. solid blocks 4, 6 and 7 in. long, and short pieces which went in as sticks 36 in. long.

Send the coupon for FREE Bulletin and complete information

MORRIS MACHINE WORKS, Baldwinsville, N. Y.

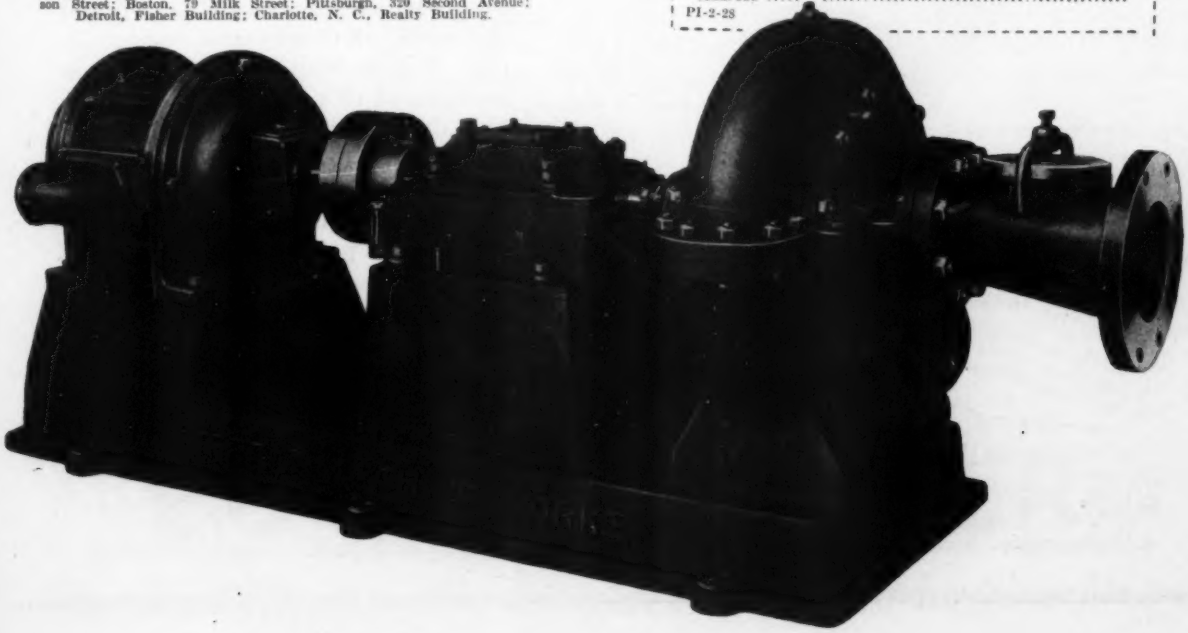
Please send free copy of Bulletin 122 and information on **Morris Non-clogging Centrifugal Pumps.**

Name .....

Company .....

Address .....

PI-2-28



THE 'GRAVEYARD WATCH'

OFTEN during the small hours of morning, the glare of lights and the roar of machinery emanate from the laboratories of the Standard Oil Company (Indiana). Inside, lubrication engineers are standing the 'graveyard watch'— constantly testing and checking the lubrication of racing machines.

Hour after hour, day and night, each Standard Lubricant has been tested under the most severe conditions that lubrication engineers of the Standard Oil Company (Indiana) can devise. When a Standard lubricating oil or grease is offered to industry it has successfully demonstrated its qualifications to meet every requirement demanded in actual service. It is as nearly perfect as modern science can make it.

Regardless of your lubrication requirements there is a pre-tested Standard oil or grease that will do the work efficiently and economically. Which Standard Lubricant is best suited to your needs is a question that our Lubrication Engineers will be glad to help you answer. To have one of these experts make a study of your plant and offer recommendations places you under no obligation whatever. You can arrange for this service by getting in touch with our nearest branch office.

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CHICAGO SYMPHONY ORCHESTRA
SUNDAY EVENING 6-7 o'clock C.S.T.
OVER FOLLOWING
WGN Chicago WOC Davenport WOW Omaha
WTMJ Milwaukee WHO Des Moines KSTP St. Paul
KSD St. Louis WDAF Kansas City WEBC Superior

STANDARD OIL COMPANY *(Indiana)*

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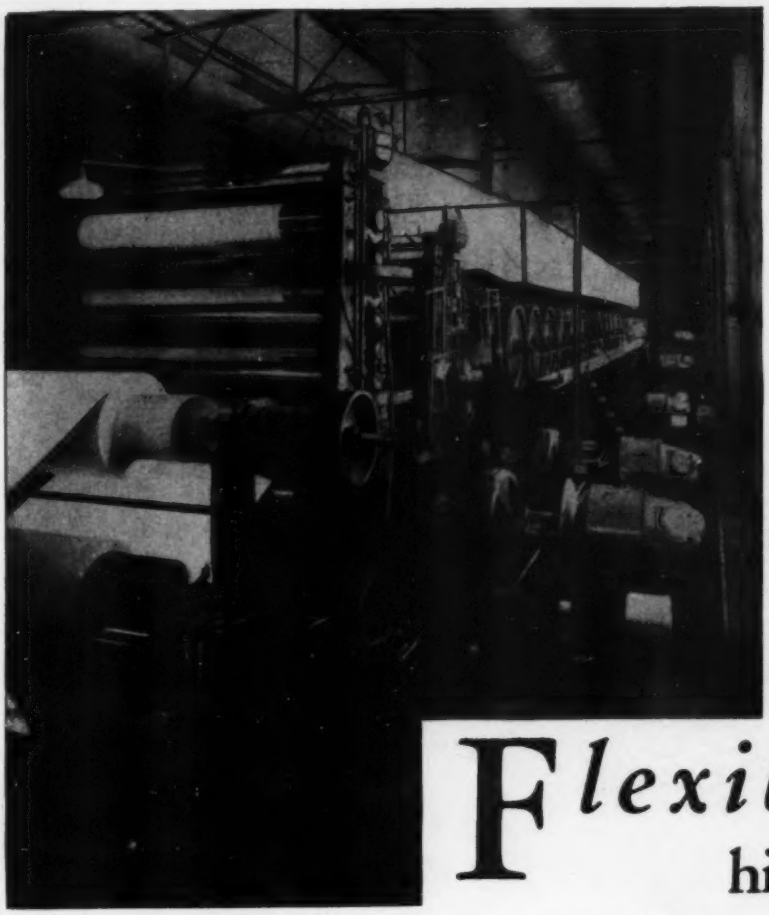


A 200 to 600 F.P.M. Machine equipped with C-H Harland Drive by Cutler-Hammer Engineers for the Mead Fibre Co., Kingsport, Tenn.

On "Job" Machines

Flexibility . . . hitherto unknown

Exact synchronization of sections is essential for paper machine flexibility, for the quick changes of speed required on machines used for job work.

The speed of all sections is so exactly synchronized by the Cutler-Hammer Paper Machine Drive that draw is practically vibrationless. Speed, and with it the weight of paper, can be widely and quickly changed, by pushing a button, if you like, right on the machine floor.

Of course—on any machine, on any class of work, this smoother draw makes paper breaks few and far between. That's why 50 hr. runs without a break are commonplace with C-H equipped machines—why they can be driven at higher speeds safely—why C-H equipped machines break and re-break tonnage records—why they always produce uniform quality of paper.

C-H (Harland) Drive is simpler—more quickly adjusted for production. Many times a profitable tonnage of salable paper is made the first day stock is put on the wire with C-H Drives—and they are easily cared for by any mill electrician.

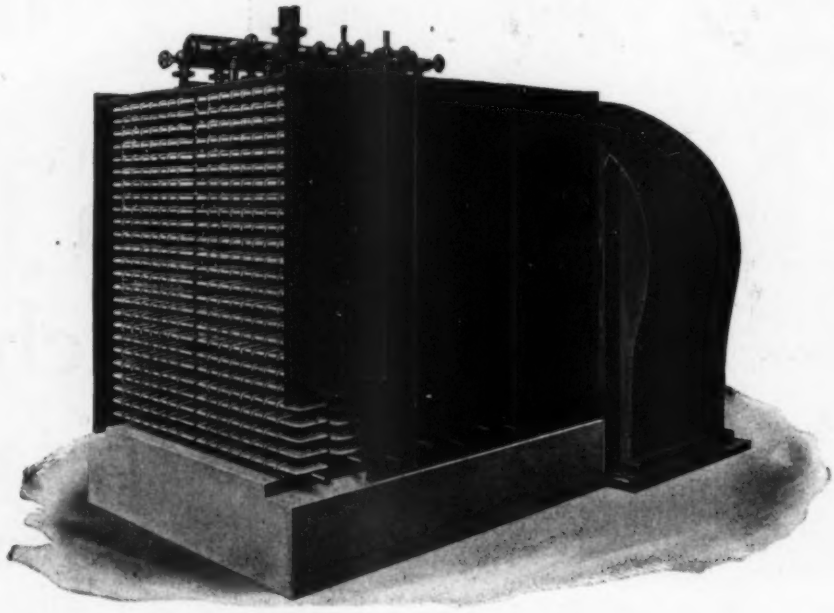
Surely these advantages merit the investigation of any executive. Write for complete information.

CUTLER-HAMMER, Inc.
Pioneer Manufacturers of Electric Control Apparatus
1271 St. Paul Avenue MILWAUKEE, WISCONSIN

CUTLER HAMMER

Harland Electrically Interlocked Paper Machine Drive
(8642)

Stickle Blast Coil Heater or Economizer Will Dry Your Felts With Hot Air

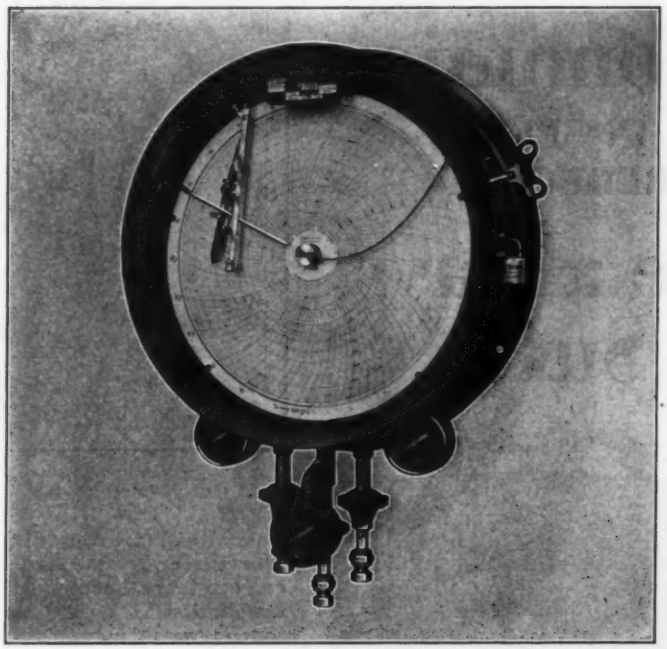


STICKLE air cooled condenser maintains a vacuum of 10 to 15 inches on the return line of your paper machine, returns condensate to the boiler room as hot as it can be handled with a pump without the admission of cooling water. Will heat 1000 cubic feet of air per minute for every ton of paper dried per day, furnishing hot air in the pit to dry the felts and absorb the vapor under the dryers, making a direct saving of at least 15 per cent in steam consumed for drying the paper and ventilating the machine room. This can be done at a moderate cost. Are you interested? Complete plans furnished without charge.

Stickle Steam Specialties Co.
INDIANAPOLIS, IND.

AUTOMATIC STEAM CONTROLS
BLOWING THROUGH DRAINAGE SYSTEMS
COMPLETE LINE STEAM SPECIALTIES

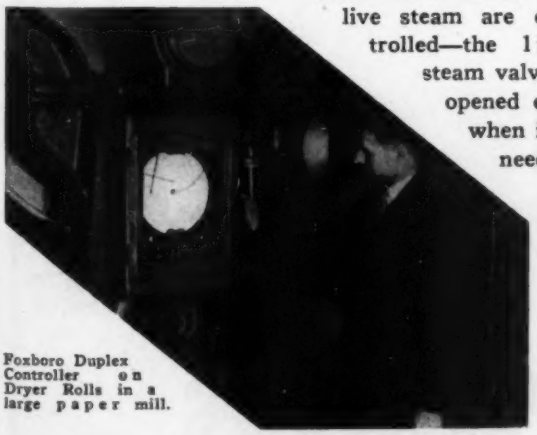
Dryer Roll Temperatures must be right . . .



Foxboro Duplex Recorder-Controller.
Foxboro controls and records from the same thermal element. This insures accuracy.

A Foxboro Duplex Controller will hold dryer rolls at the proper temperature to assure fast production of paper of a uniform moisture content. Temperatures are controlled even when the paper breaks.

A Foxboro Duplex Controller will save steam because both the exhaust and live steam are controlled—the live steam valve is opened only when it is needed.



Foxboro Duplex Controller on Dryer Rolls in a large paper mill.

The charts are a permanent and accurate production record. They serve as a constant check on the operation of the control and on the moisture content of the paper.

The Foxboro Guarantee of permanent calibration is sealed to each instrument. It is your assurance of years of reliable operation and that Foxboro Duplex Controller will do the job for which it is sold.

A Foxboro Engineer can show you how Foxboro Instruments are saving money in the Paper Industry. Write the nearest Branch.

THE FOXBORO COMPANY

Neponset Avenue, Foxboro, Mass., U. S. A.

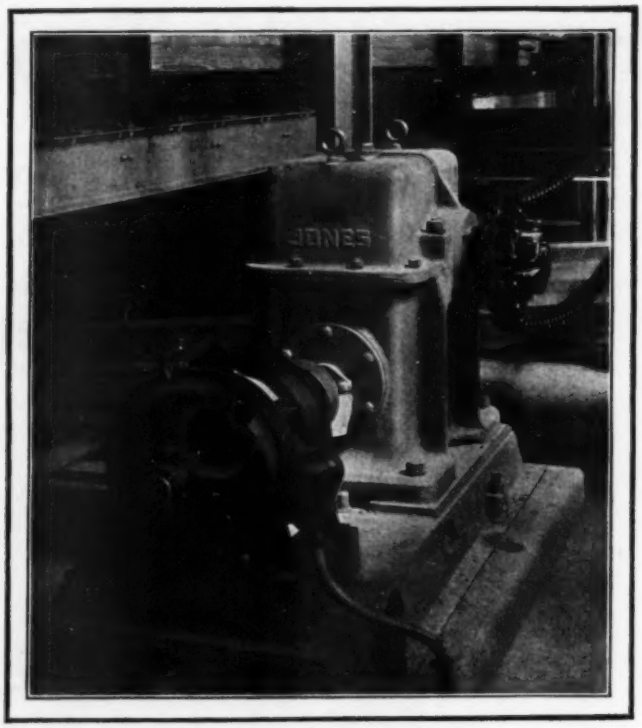
New York Chicago Philadelphia Boston Pittsburgh
Detroit Cleveland Tulsa Rochester, N. Y. Atlanta
San Francisco Salt Lake City Dallas Los Angeles Portland, Ore.

FOXBORO
REG. U. S. PAT. OFF.

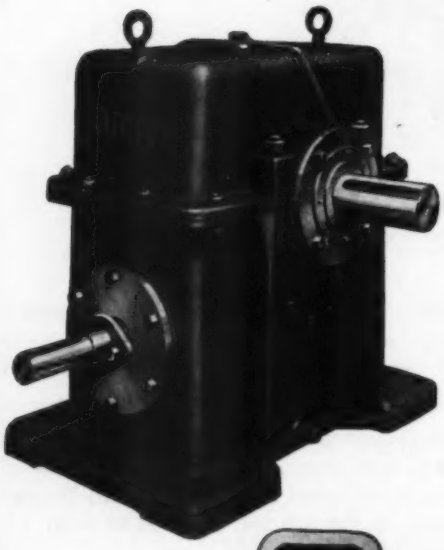
THE COMPASS OF INDUSTRY

INSTRUMENTS FOR CONTROLLING, RECORDING AND INDICATING TEMPERATURE, FLOW, HUMIDITY AND PRESSURE

THESE Economies IN SPEED REDUCTION are always Sure



Jones Heavy Duty Worm Gear Speed Reducer driving feeder conveyor in paper mill. Reduction ratio 69-1.



Your decision to install Jones Worm Gear Speed Reducers is an economy measure. Your installation costs are usually much lower. You transmit more power for less money. Depreciation is a negligible item because there is little wear and tear to a Jones Reducer. The Worm and Worm Gear operate in an always clean oil bath. No dirt or dust can penetrate the protective housing. Upkeep expense can be forgotten, for there is nothing to get out of order. A few times a year refill the oil bath—that's the only attention required.

Valuable production space is saved and released for productive purposes. Danger of injury to workmen is eliminated. Be sure to specify Jones Worm Gear Reducers. Their operating economy far more than offsets their cost.

W. A. JONES FOUNDRY & MACHINE COMPANY

Main Office and Works: 4436 W. Roosevelt Rd., Chicago

Branch Sales and Engineering Offices:

New York Cleveland Milwaukee Pittsburgh Buffalo Detroit Birmingham
St. Louis Cincinnati Kansas City, Mo. Los Angeles San Francisco

Jones
WORM-GEAR
Speed Reducers

TIMKEN EQUIPPED

Contributor to MANY SUCCESSES

the COE BOARD DRYER

Through its product, the Coe Board Dryer, this Company aids in the successful manufacture of many building and insulating boards, a few names of which appear here.

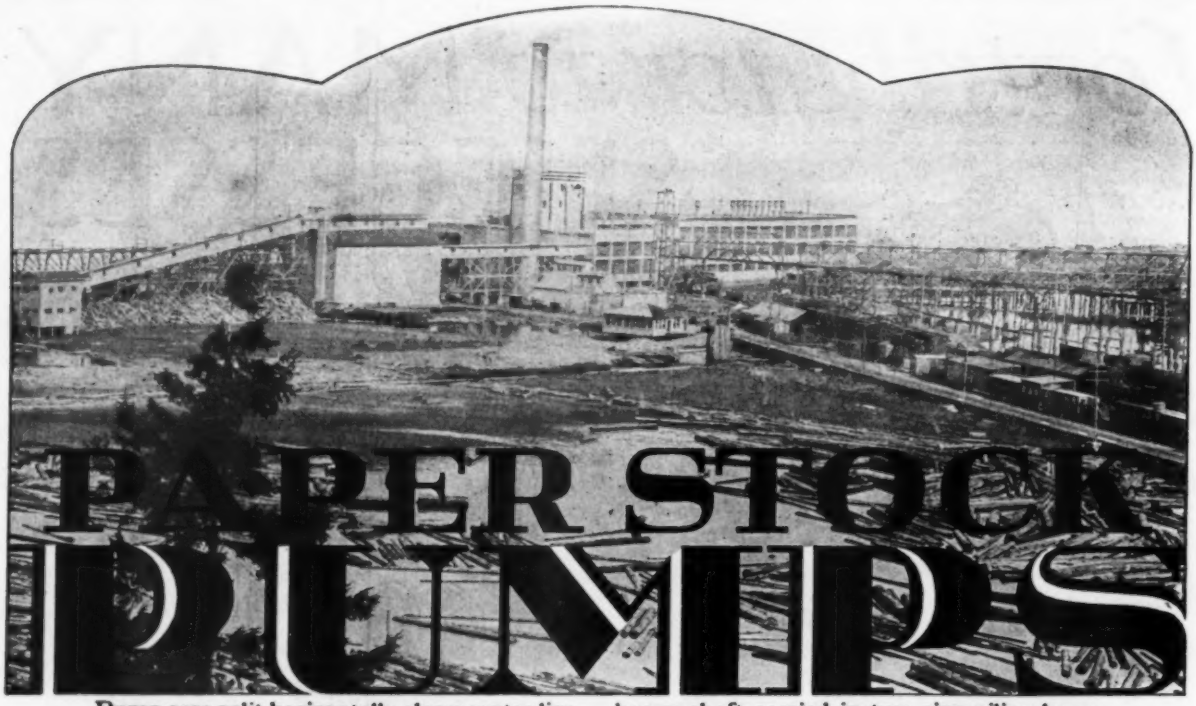
The diversity of ingredients used in these well-known products indicates the ability of Coe engineers to develop machines for boards of various kinds made from practically any material.

The new catalog of Coe Board Dryers tells the complete story.

You may have a copy, gratis, on request.

The COE MANUFACTURING CO.

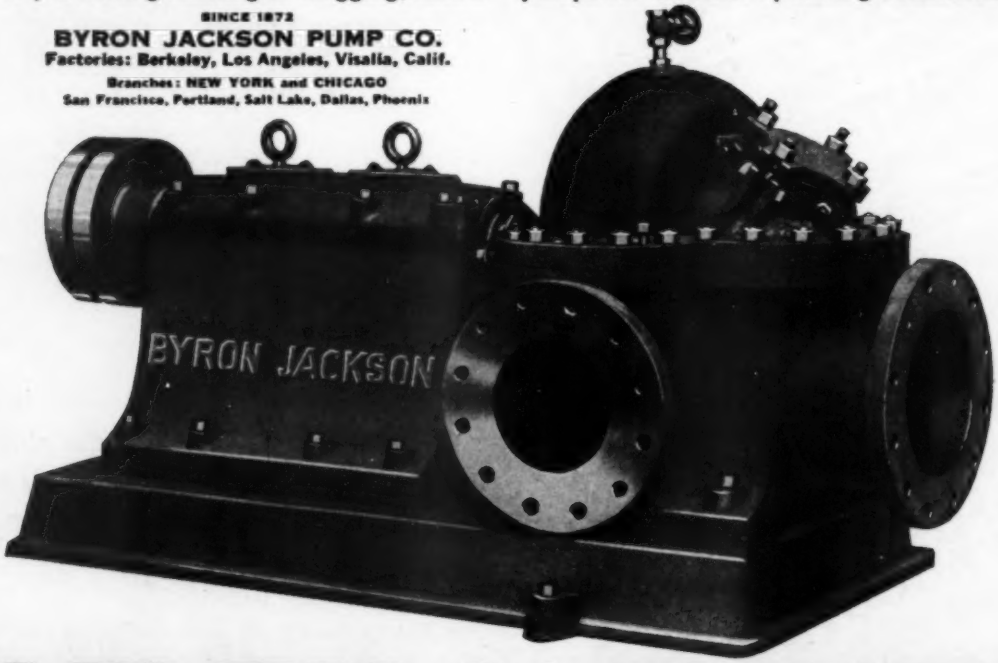
382 Bank St. Painesville, Ohio



PAPER STOCK PUMPS

Pump case split horizontally along center line of shaft; accessability of hydraulic working parts by removal of top half of case without disturbing pipe connections; open type impeller preventing matting or clogging; Extra heavy shaft carried in two ring oiling bearings mounted in external bearing bracket completely separate from all hydraulic parts of the pump. ¶Process and water service pumps for all other operating conditions.

SINCE 1872
BYRON JACKSON PUMP CO.
Factories: Berkeley, Los Angeles, Visalia, Calif.
Branches: NEW YORK and CHICAGO
San Francisco, Portland, Salt Lake, Dallas, Phoenix



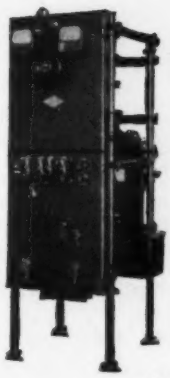
BYRON JACKSON
CENTRIFUGAL PUMPS FOR EVERY SERVICE

Two of the three E-M Synchronous Motors driving pocket pulp grinders in the Cushnoc Paper Corp. mills at Augusta, Maine. Each of these motors develop 1675 H.P. at 240 R.P.M. and have been in operation since 1924.

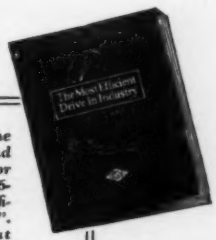
How Shall We Drive Pulp Grinders?

IT doesn't take much of a memory to hark back to the time when synchronous motor drives for pulp grinders were few and far between. And today . . . *look* at the change! The synchronous motor has become standard for this kind of drive.

This in itself shows how completely *synchronous* motors meet the requirements of this severe duty. But that is not all. The large proportion of these synchronous motors driving pulp grinders which carry the familiar E-M trade mark shows the large part E-M Engineers have played in this development. And the repeat orders from mills using E-M Motors show why they are the standard of comparison for economy and dependability.



E-M Engineers have been in close contact with the pulp and paper industry since the commercial introduction of Synchronous Motors. It is through their intimate understanding of the field that such unparalleled advantages as E-M frequency relay starting can be offered. This E-M Starter unfailingly applies excitation at the correct motor speed thus making possible a minimum power line disturbance and quickest possible starting. Further, should the motor fall out of step due to momentary loss of power, excitation is removed and the motor automatically resynchronizes.



Every man interested in the cost of electric power and the dependability of motor drives should have this 56-page book, "The Most Efficient Drive in Industry". It will be sent without charge if you state your title and show your company's name.

Electric Machinery Mfg. Company

Specialists for 18 Years in Synchronous Machinery

1341 Tyler Street, N. E. Minneapolis, Minn.

Sales Offices in Principal Cities

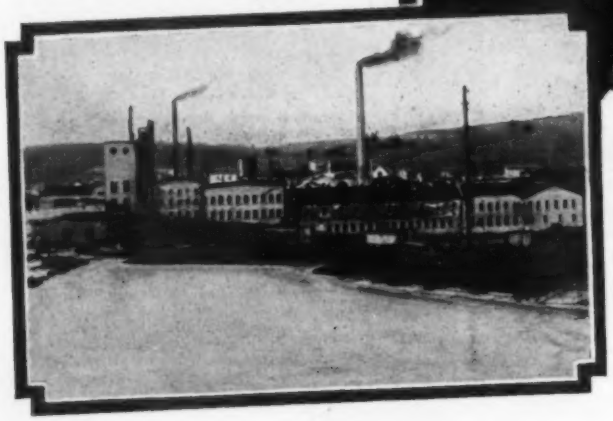
EM *Synchronous* MOTORS

THE DEPENDABLE ECONOMICAL DRIVE FOR PULP AND PAPER MILLS

(1005)

Arrangement of the Foster superheater, having alternate elements omitted so as to give a moderate degree of superheat for the present.

General views of the Wausau Paper Mills Co., Brokaw, Wis.



Foster Superheaters at Wausau Paper Mills Co.

The flexibility of Foster superheater design is well illustrated by the installation made in two 512 hp. Springfield boilers at the plant of the Wausau Paper Mills Co., Brokaw, Wisc.

The plant is designed for 450 lb. steam working pressure with 150 deg. F. superheat at 150 per cent of boiler rating. Arrangement is made for present operation at 125 lbs. pressure and 75 deg. F. superheat. Foster superheaters are shown installed with alternate elements omitted, to give the lower superheat. The addition of the balance of the superheater elements will supply increased superheat when desired for new prime movers.

This Foster superheater design is typical of mill installations aggregating hundreds of thousands of horsepower now in operation.

FOSTER WHEELER CORPORATION
165 Broadway, New York, N. Y.
Branches in Principal Cities

Foreign Associates:—
Foster Wheeler Limited; London, England
Foster Wheeler Limited; Toronto-Montreal-Vancouver, Canada

FOSTER WHEELER

Samples of condensate before and after passing through a Permutit Oil Removing Filter.

TAKE out the oil

and save $10,000 per 1000 b.h.p. per year

How much does oily condensate cost you?

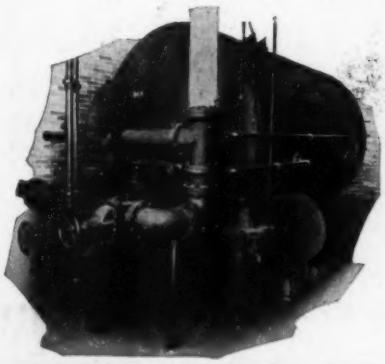
A 1000 h.p. boiler uses about 96,000 gallons of water in 24 hours. Assume 75% condensate available, that is, 72,000 gallons. If this can be returned to your boiler, you save the heat that the water contains, which averages 77,700,000 B.t.u., or the equivalent of 5 tons of coal.

If you don't return the condensate to your boilers because it contains oil, you are wasting 5 tons of coal a day, or $6,000 yearly.

And that isn't all that it costs you to run your condensate to waste. You are further losing the cost of softening 72,000 gallons of water in 24 hours, because it is soft water, ideal boiler feed except for the oil. At 17 to 19 cents per 1000 gallons, this would amount to $4000 annually. Together with the wasted coal, this makes a total loss of $10,000 a year, which you will remember is based upon a unit of 1000 b.h.p.

Perhaps this is an extreme case, but it shows how a Permutit Oil Removing Filter saves money. It will take oil out of water, both that in suspension and emulsion. It is compact—simple to operate and maintain, and guaranteed to deliver oil-free water that is perfect for boiler feed. The filtering medium never has to be removed or renewed as in most other filters.

It will pay you to know more about this filter. Write for our interesting booklet, "Saving Fuel and Repairs with Oil-Free Feed Water." No obligations.



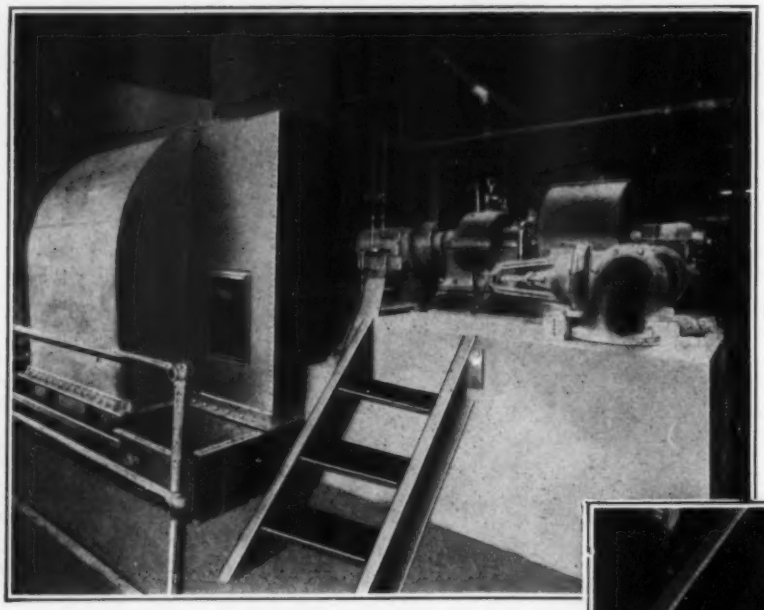
A simple apparatus like this can recover the condensate that is now being wasted.

The Permutit Company

APPARATUS FOR REMOVING IMPURITIES FROM WATER

MAIN OFFICE: 440 FOURTH AVENUE, NEW YORK — BRANCH OFFICES IN ALL PRINCIPAL CITIES

For Cinder and Dust Elimination



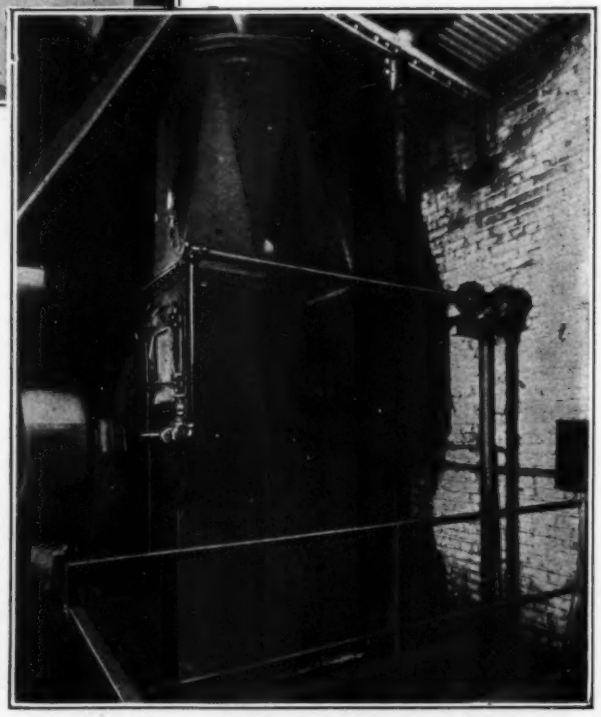
Four Buffalo Cinder Eliminating Induced Draft Fans each handling 125,000 cubic feet of hot gas per minute from stoker fired boilers.

"Buffalo"

Cinder Fans and Centrifugal Washers

Cinder and dust collection, vitally important in the paper mill of today, is handled with excellent results by the Buffalo Equipment illustrated here. Dust elimination problems particularly require experienced engineering ability, and Buffalo engineers have had more than the usual amount of experience in practical development of equipment for this service.

Branch offices in all principal cities are ready to work with you on any problem involving the handling of air. Why not take advantage of their experience?



A Buffalo centrifugal scrubber also serving as a booster fan —successfully removing 97 per cent of dust from closed mill powdered coal system.

Buffalo Forge Company, 213 Mortimer St., Buffalo, N. Y.

In Canada: CANADIAN BLOWER & FORGE CO., LTD.

"Buffalo"

Paper Mill Equipment, Mechanical Draft Apparatus, Heating and Ventilating Equipment, Unit Heaters

ONE DECISION COVERS—

paint ✓
equipment ✓
application ✓
economy ✓
satisfaction ✓
permanence ✓

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and your plant painting problem is well on the way to being solved.

Vortex gives you a complete painting program, including a distinctively better paint and the means of getting it on the wall, with the least fuss and finest results. Scores of big industrial users say VORTEX every time.

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We are considering an ☐ inside ☐ outside job to do approximately _____ sq. ft. Send your large area specialist to look it over and to tell us how to handle it from start to finish in the most practical and least costly way.

Company _____

Address _____

Attention _____

V-54

The Label

DRYING FIDALGO SYSTEMS

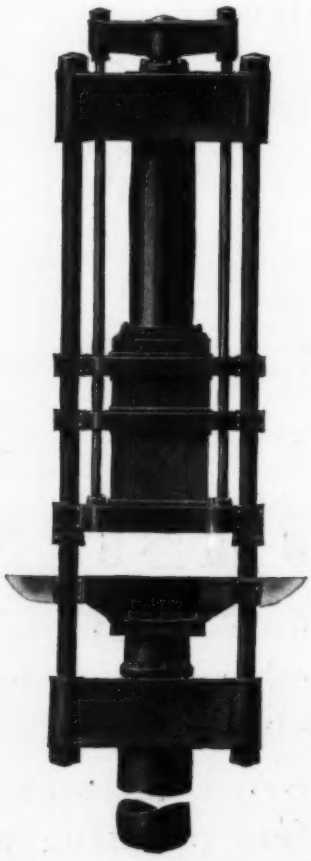
on the Bale

FIDALGO DRYING SYSTEMS

Experience in complete installations make Satisfied Customers

New type pulp shreds coming off dryers.
Union Bag Pulp Mill, Tacoma, Wash.

Unwrapped pulp storage.
Union Bag Pulp Mill, Tacoma, Wash.

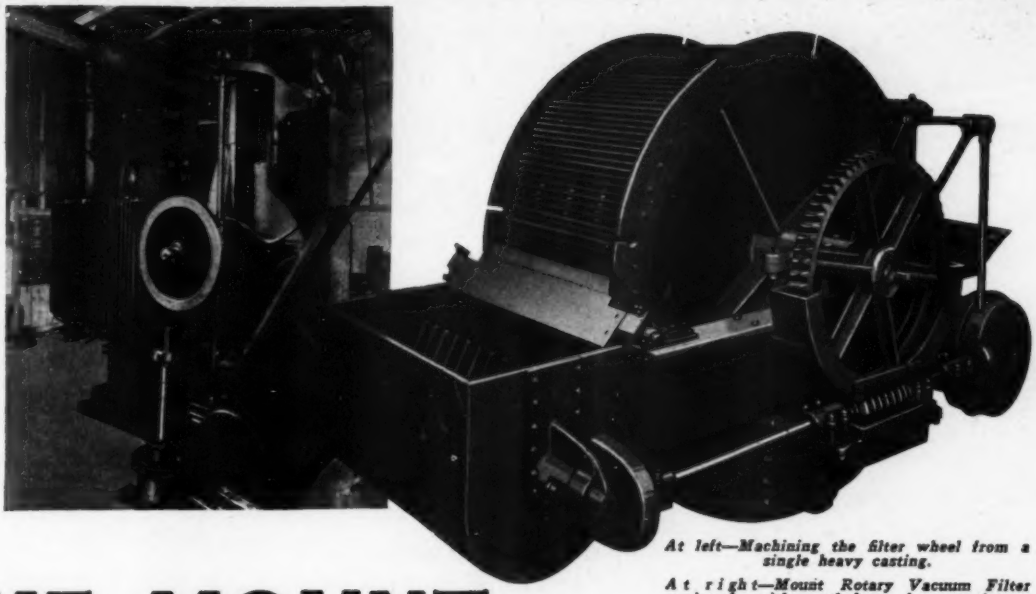


Patented Hydraulic Baler for wrapped or unwrapped pulp. Bales reduced to 40 cu. ft. per 2000 lbs. Uniform in size and weight. Sample sheet in each bale.

Users prefer pulp dried by this system.
Complete patent protection guaranteed.
Same strength in beater with new shred as wet pulp.

TECHNICAL ECONOMIST CORPORATION

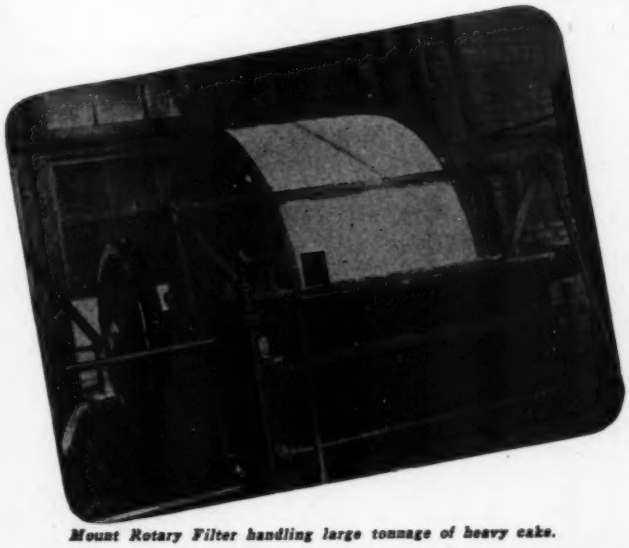
40 RECTOR ST. N. Y. CITY



At left—Machining the filter wheel from a single heavy casting.

At right—Mount Rotary Vacuum Filter equipped with resludger for continuous handling and washing of lime sludge in recovery department of sulphate mill. (Shop view with wire cloth removed.)

THE MOUNT ROTARY VACUUM FILTER



Mount Rotary Filter handling large tonnage of heavy cake.

answers the demand of the pulp industry for continuous equipment. The distinct success of this equipment through years of service proves that it is truly continuous, with time of shutdown for repairs practically eliminated. The fundamental design removes the cause of many shutdown periods experienced with some vacuum filters and the ruggedness of construction overcomes all mechanical difficulties.

We will gladly consult with you regarding any special problems. Descriptive bulletins on request.

SWENSON EVAPORATOR CO.

(Subsidiary of Whiting Corporation)

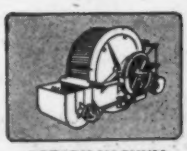
15673 Lathrop Ave., HARVEY, ILL. (Chicago Suburb)

SWENSON

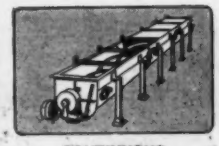
BASKET TYPE EVAPORATORS

VERTICAL TYPE EVAPORATORS

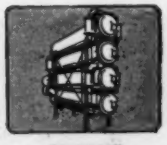
HORIZONTAL TUBE EVAPORATORS



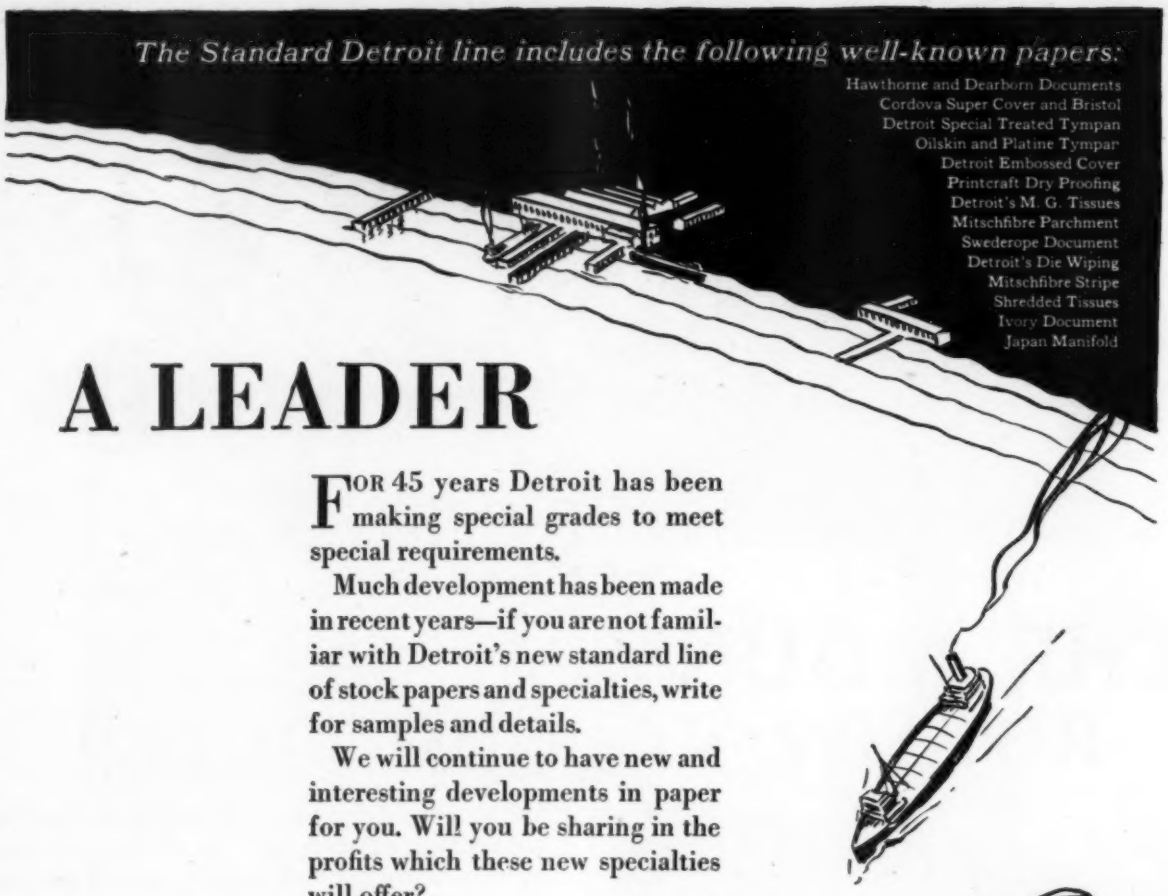
ROTARY VACUUM FILTERS



CONTINUOUS CRYSTALLIZERS



YARYAN EVAPORATORS



The Standard Detroit line includes the following well-known papers:

Hawthorne and Dearborn Documents
Cordova Super Cover and Bristol
Detroit Special Treated Tympan
Oilskin and Platine Tympar
Detroit Embossed Cover
Printcraft Dry Proofing
Detroit's M. G. Tissues
Mitschfibre Parchment
Swederope Document
Detroit's Die Wiping
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Shredded Tissues
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A LEADER

FOR 45 years Detroit has been making special grades to meet special requirements.

Much development has been made in recent years—if you are not familiar with Detroit's new standard line of stock papers and specialties, write for samples and details.

We will continue to have new and interesting developments in paper for you. Will you be sharing in the profits which these new specialties will offer?

"MAKERS OF PAPERS OF STRENGTH"

Detroit Sulphite Pulp & Paper Co.

DETROIT, MICH.

Eastern Representative, 11 W. 42nd Street, New York City
Canadian Representatives, Paper Sales Ltd., Toronto and Montreal

CORROSION CONQUERED!

Written Proof from leading firms in industries faced with costly problem

From Malleable Iron Company
"Our stacks are exposed to high temperature. NITROSE has been of more protection than anything else we have ever used."

From Leading Coal Company
"We have used NITROSE paint on our tipple and steel water tank with wonderful results. NITROSE gets to the metal, adheres strongly to it, and retains an unequalled finish and gloss. We do not anticipate having to purchase paint for a long time."

From Beverage Maker
"NITROSE has withstood our most severe conditions, moisture, rust, ammonia-fumes, 500 degree heat, below-freezing cold and has given the best satisfaction in every respect. It has greatly saved us time and expense in that surfaces do not have to be dry, clean and free from rust as is the case with ordinary paints."

From Prominent Salt Company
"NITROSE painted on hot and cold surfaces, and on surfaces which encounter brine spray —has stood up better than any other paint we have ever used. This paint is worthy of a trial by all who have conditions similar to ours and who want the best results."

Any form of corrosion which attacks your equipment can be conquered by NITROSE, the one thing corrosion *cannot* eat. Here is proof that it is the most effective and economical protection against heat, acid, rust, grease, gas, chemicals, acid fumes, brine solutions, ammonia and alkalis. Insures longer protection. Elastic under all temperatures; expands and contracts without peeling or cracking.

NITROSE penetrates clear through corrosion, actually *welding* into the bare metal! Most economical to use; no primer coat, no cleaner, no thinner, no sand blasting. As easy to use as paint. Costs less because it goes farther.

What NITROSE, "the liquid armor" has saved others, it can save you. Write for sample and free consultation on your corrosion problem.

The NITROSE Company
1500E Peoria Life Bldg., Peoria, Ill.

Stocks: Peoria, Detroit, Cleveland, Rochester, Kansas City, New York, Los Angeles, San Francisco, Seattle.

NITROSE

THE JOHNSON FRICTION CLUTCH

Various Views of
JOHNSON CLUTCHES
As Used on
PAPER MACHINERY

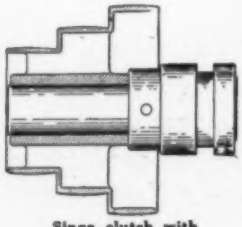
Single clutch exterior

Double clutch exterior

A QUALITY PRODUCT

WRITE FOR CATALOG P. I.

Dependable **Durable**



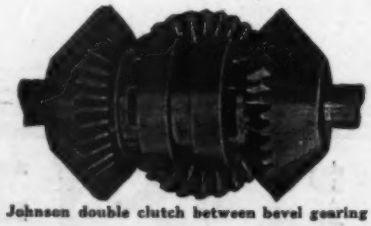
Singe clutch with cone pulley

Single Clutch With Steel Split Pulley Mounted on Hub

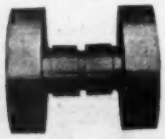
Single clutch with spur gear

Efficient **Reliable**

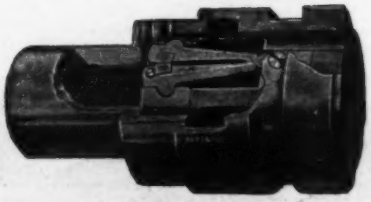
BE SURE IT'S A JOHNSON



Johnson double clutch between bevel gearing



Double Clutch with Pulleys Mounted on Hubs



Single clutch, sectioned

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

Nash pump driven by 100 h.p. motor equipped with the LENIX.

Double headed motors equipped with LENIX units driving beaters.

Keeping Belt Tension at a Minimum Prolongs Belt Life

—one of the advantages of the LENIX Drive

WITH any non-positive drive, more "grip" can be obtained by tightening up on the transmitting medium.

But this is trading off a temporary gain in efficiency for permanent damage to the belt or rope. For running these above the permissible tension definitely shortens their life.

The LENIX by contrast operates with the belt at the minimum tension and yet maintains an efficiency of 98% or better.

The LENIX can be applied to existing drives as well as to new drives. On the former, send complete details to our engineers. On new equipment tell us the manufacturer and we'll arrange with him to include the LENIX on your machine.

F. L. SMIDTH & COMPANY

Engineers Incorporated 1895

225 Broadway, New York, N. Y.

The LENIX *Drive*

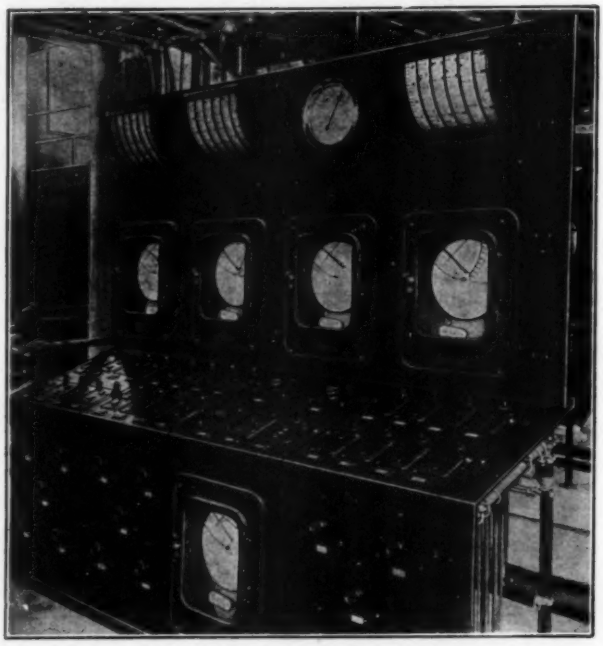
Reg. Trade Mark

Bailey Meters

Are Serving Leaders in the Paper Industry

Prominent Paper Companies Using Bailey Meters

	Meters
Abitibi Power & Paper Co.	25
Algonquin Paper Company	25
American Writing Paper Co.	16
Champion Coated Paper Co.	31
Cherry River Paper Company	17
Dill and Collins	11
Eddy Paper Corporation	14
Escanaba Paper Company	19
Fraser Paper Company	25
Gardner Harvey Paper Co.	38
Great Northern Paper Co.	84
Hinde & Dauch Paper Co.	21
International Paper Co.	84
Kimberly Clark Company	82
Lake Superior Paper Co.	21
Laurentide Company	25
Mead Pulp and Paper Co.	23
Minnesota and Ontario Paper Co.	64
National Paper Products	11
Nekoosa Edwards Paper Co.	54
Oxford Paper Company	35
Spanish River Pulp and Paper Co.	34
St. Maurice Paper Co., Ltd.	20
Thilmany Pulp and Paper Co.	16
United Paperboard Co.	15
Waldorf Paper Products	15
West Va. Pulp and Paper Co.	173



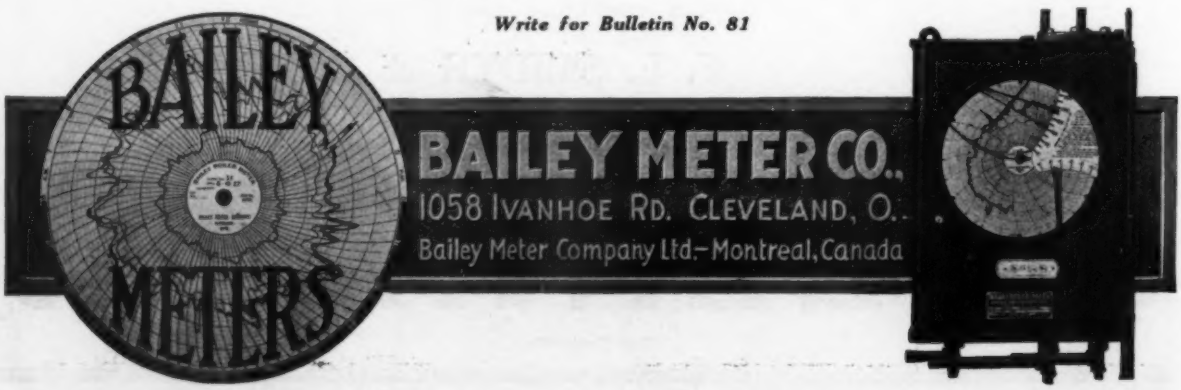
Bailey Boiler Meters and Multi-Pointer Gages at the Mead Pulp and Paper Co., Chillicothe, O.

Every paper mill Manager, Superintendent and Engineer is anxious to reduce the steam consumption per ton of paper produced to the lowest possible point. This can best be done by installing a Bailey Boiler Meter and a Bailey Multi-Pointer Gage on every boiler so as to give the operators complete information for controlling the boilers in such a way as to obtain the highest possible heat output from the fuel burned.

Bailey Fluid Meters should also be installed on the steam and water lines to various departments so as to enable a complete and accurate accounting of these fluids. It is extremely important to measure, not only the steam to each paper machine, but also the steam to each group of paper machine auxiliaries so that faulty or inefficient operation can immediately be detected.

Write for your copy of "The Heat Balance in Steam Power Plants." It's free.

Write for Bulletin No. 81



The Gate that held!

In ancient war days, the massive gates to the fortress were built to withstand the onslaught of huge battering-rams borne on the shoulders of husky warriors. The gates must hold—once entrance was gained no quarter was given.

It's a far cry from ancient fortress gates to modern gate valves. But present day steam pressures likewise demand sturdy barriers, to repulse the enemies of economical operation—wasteful leakage, time out for repairs and excessive maintenance expense.

Lunkenheimer Iron Body Gate Valves present an impregnable defense against the flow of steam, gas, water, oil, etc. They hold tight and insure continuous satisfactory service over long periods of time.

Numerous plants have solved their gate valve problems by installing "Lunkenheimer". The wide range of patterns and sizes offers an economical standardization plan for any service where valves of this type are adaptable.

Lunkenheimer
Iron Body Bronze Mounted Gate Valves

Standard	125 lb. W. S. P., 2 to 24 in.
Heavy	175 lb. W. S. P., 2 to 12 in.
Extra Heavy	250 lb. W. S. P., 1½ to 18 in.

Also procurable in All-Iron Pattern for handling solutions which attack bronze, and with lever for Quick Operating purposes.

Lunkenheimer Iron Body Gate Valves are illustrated and described in Gate Valve Book No. 511. A copy can be had upon request—either from The Lunkenheimer Distributor in your locality or by writing direct.

LUNKENHEIMER
VALVES

CINCINNATI, OHIO U. S. A.

NEW YORK CHICAGO BOSTON PHILADELPHIA PITTSBURGH SAN FRANCISCO LONDON

6-58-67

1828 *Made in New England* 1828

THE FIRST IMPROVED FOURDRINIER MACHINE

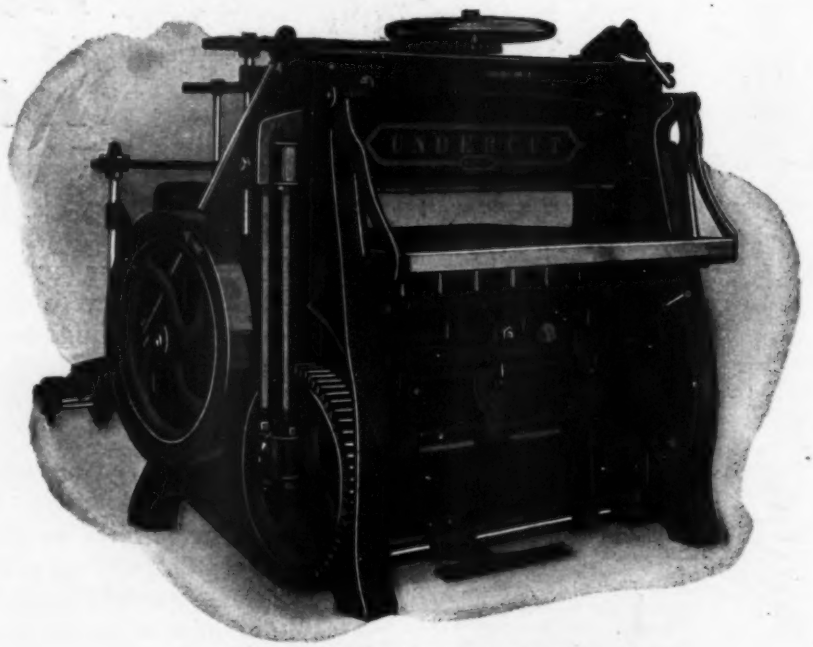
Designed and built at South Windham, Connecticut, in the shops of THE SMITH WINCHESTER & CO., and in successful operation at Norwich Falls, Conn., in May 1829.

ONE HUNDRED YEARS OF SERVICE

in the designing and production of improved machinery for the making of paper

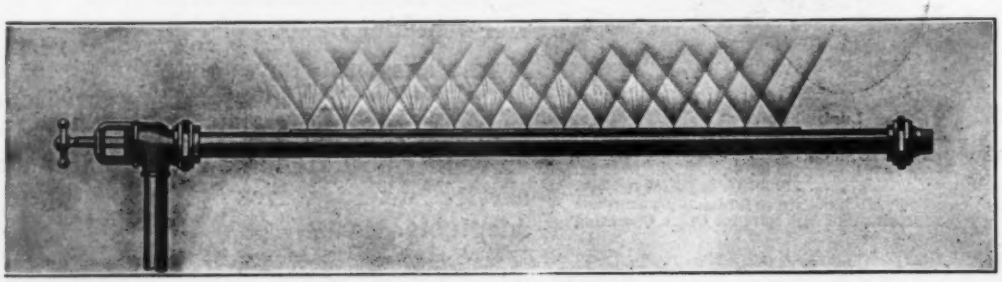
TODAY!

We are making installation of Fourdrinier machines for the production of the finest grades of condenser papers



THE UNDERCUT PAPER MILL TRIMMER

PAPER BAG MAKING MACHINERY



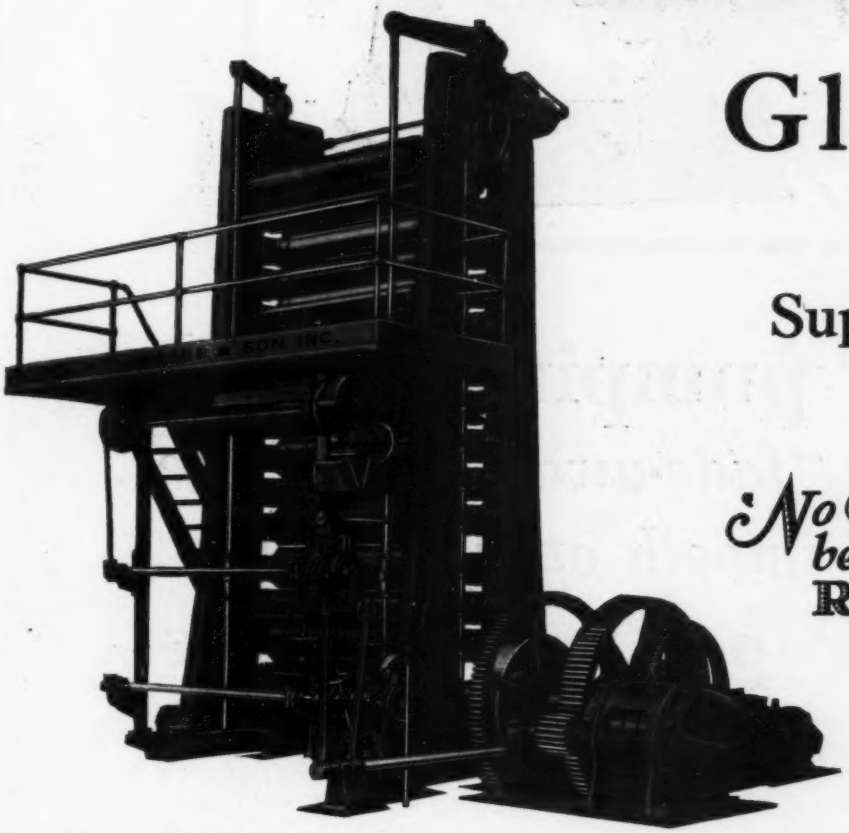
THE "RAINSTORM" SHOWER PIPE

1929 **THE SMITH & WINCHESTER MFG. CO.** 1929

SOUTH WINDHAM, CONN.

Glassine
Web
Supercalender

"No Calender can be better than the Rolls in it"



Fourteen Roll Calender. Two motor type drive.

When the glassine sheet comes to the calender it represents a considerable investment. The glassine manufacturer has every right to expect that it will be calendered with minimum loss. It must be uniform, transparent and dry. It must not curl and must not go back to the beaters as broke.

Perkins Glassine Calender has been built to meet these requirements. It is a rugged calender. The stack is extremely heavy and fully equal to the day-after-day strain put upon it.

There are many strong features in Perkins design of Calenders that bring about high quality and high quality production, one of the most important of which is extreme ruggedness where strength is a factor.

B. F. PERKINS & SON, INC., HOLYOKE, MASS.

Cotton Rolls
Paper Rolls
Embossing Rolls
Chilled Iron Rolls
Granite Press Rolls
Web Supercalenders
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Friction Calenders
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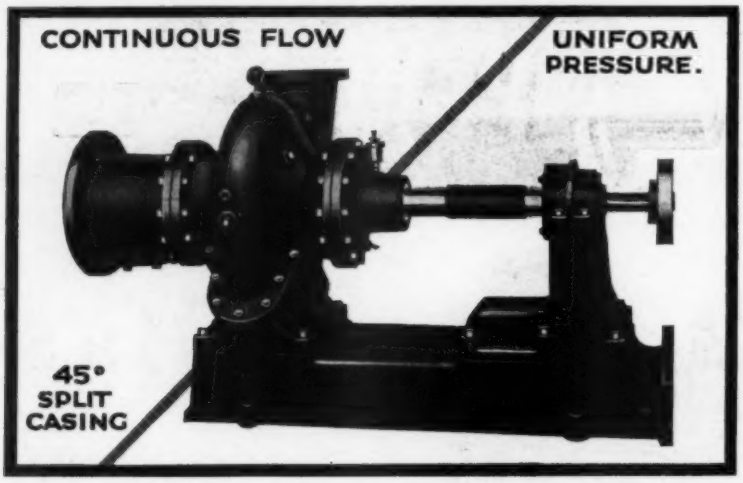
Mullen Paper Testers
Tensile Testers
Ventilating Fans
Rag Cutters
Stock Cutters
Paper Dampeners
Bleach Ejectors



Stock pumping troubles

do the "fade-away act" before the smooth operation of

F-M Paper Stock Pumps

That "art is long and life is short" has been common knowledge for a number of years—and the art of paper making is no exception to the rule. Life is too short to get gray headed over pumps that clog, holding back solutions and tying up the whole works.

The special 3-blade patented impeller in the Fairbanks-Morse Stock Pump handles stock solutions of all kinds without separating solids from liquids —assuring a continuous, smooth flow at uniform pressure. There are no sharp edges to prevent free passage of stringy solids and the 45° split casing simplifies inspection. High shut-off pressure eliminates the necessity of frequent cleaning.

You can't do better than lay your stock pumping problems before Fairbanks-Morse engineers. Their recommendations do not obligate you in any way.

FAIRBANKS, MORSE & CO.
900 S. Wabash Ave., Chicago

28 branches at your service throughout the United States

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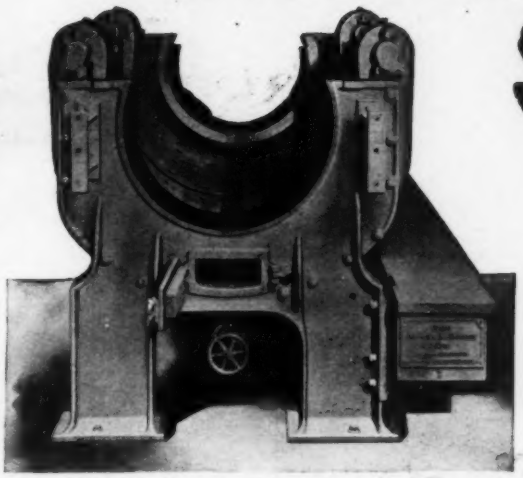
PA 18.21

"M&W" Rotary Screen



View of Rotary Screen with cylinder removed. Note divided diaphragms, large openings.

with important new features for "ideal" screening

Every one of these points has been considered in building the "M & W" Rotary Screens now being placed on the market.

Recent improvements are fully covered by United States and Foreign Patents.

Write for New Screen Booklet

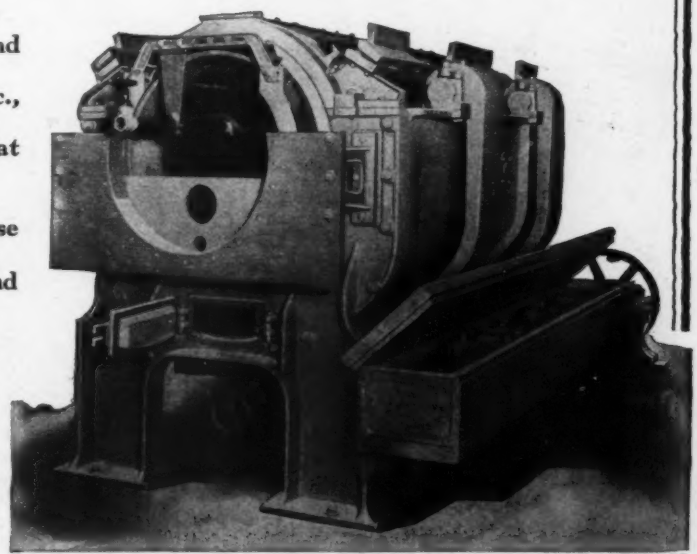
TO PAPER MILL MANAGER:

Here is a list—compare it with your mental picture of what you would consider "ideal" screening for your paper mill—

1. Quick removal of dirt.
2. Large capacity.
3. Minimum power, vibration and wear.
4. No possibility of lumps, etc., working into screened stock.
5. No pockets or dead spots in vat or cylinder.
6. Dependable lubrication.
7. No possibility of oil or grease getting into stock.
8. Quick, visible washing up and oiling.
9. Screen plate slots always open.
10. Quick changing of screen plates.
11. No shutdowns of paper machines due to screen repairs.

Or, to put it another way—

(A) ability to produce clean stock continuously
(B) quick changeover when wanted
(C) reliable operation at low cost



Note enclosed and accessible main drive, shower pipe, washout door for cleaning.

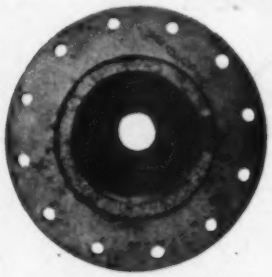
The Moore & White Co.
Philadelphia, Pa.
N. Phila. Sta. Penna. R.R.
Paper Mill Machinery

MICHIGAN PIPE COMPANY

MANUFACTURERS OF

COMBINATION STEEL AND WOOD PIPE

Office and Factory: Bay City, Michigan



SPECIAL FLANGE FOR PAPER MILLS

Note: Standard Bolt Circle. Liquid conveyed does not come in contact with metal.

PRODUCTS:

Standard Flanged Wood Pipe for Paper Mills

Pipe for conveying—
- Pure Water
- Acid Water
- White Water
- Sulphite Waste Water
- Paper Stock
- Ground Wood Pulp
- Gases

Special Fittings for Acid Work.

WRITE FOR CATALOG

SHOWING THE SPECIAL FLANGE JOINT, LIGHT IN WEIGHT, SPECIALLY DESIGNED FOR INSIDE INSTALLATIONS. EASY TO TAKE APART

SPECIAL CONSTRUCTION:

Some mills are ordering this pipe also equipped with rods, lugs and nuts spaced every 12".

ADVANTAGES:

Saves Power
No Discoloration
Lasting Qualities
Light in weight
Cheaper
No Scale or Rust
Long lengths
Easy to Install
Acid Proof
Neat Appearance

"MICHIGAN" SPECIAL PAPER MILL WOOD PIPE

EASY TO ORDER:

Just advise your lengths face to face of flanges.

Exact lengths furnished for each line.

OVER ONE HUNDRED PAPER MILLS ARE USING STANDARD FLANGED WOOD PIPE

STANDARD FLANGED WOOD PIPE RECENTLY INSTALLED IN THE PLANT OF THE OXFORD MIAMI PAPER COMPANY, WEST CARROLLTON, OHIO

This is a typical installation of Norwood Gravity Filters in a paper mill. Ask for a list of installations in your vicinity.

Are You Running Your Paper Mill For Pleasure or Profit?

IF YOU are running your mill for profit, you know full well that one of the "secrets" of making a profit in the business is the economical production of a better sheet than your competitors can produce for the same money. And one of the "secrets" of making better papers economically is the filtration of the water to remove all pollution, dirt and debris.

Of course it's no secret that Norwood Filters are installed in the majority of the mills of the country, and that they give long, dependable, trouble-free service with low operating and maintenance costs. If you want to look into the matter of economical filtration before the Spring freshets fill your water supply with foreign matter, we suggest that Now is a good time to ask Norwood's engineers to figure on a modern up-to-the-minute filtration system for your plant. Your inquiry places you under no obligation.

You can't go wrong with a Norwood installation of Filters, Calenders, Platers, Dusters, Rag Thrashers, Folding Machines or other equipment. Ask for catalogs and specifications.

Norwood Engineering Company, Florence, Mass.

NORWOOD

1864 1929

KNOX "EXCELSIOR" WOOLEN COMPANY

FELTS & JACKETS

CAMDEN, MAINE

An unbroken service record of sixty-five years has placed us in the lead for quality and uniformity of products.

We can be of service to you if you are looking for felts to meet higher speed conditions or desire better finish.

Seamless felts for fast running
Satin style felts for finish
Special felts to meet every condition
Send us your felt problems

De Laval Worm Gear
A Superior Speed Reducer
for Exposed Locations
Completely Self-Contained and Self-Lubricated
This 50 to 1 ratio gear transmits 5 HP. from a 900 RPM. motor to a vertical shaft pump. De Laval Flexible Couplings connect the gear to the driving and driven machines.
De Laval Steam Turbine Co., Trenton, N.J.

GEORGE SHEVLIN AND
The TRIMBEY-SHEVLIN "Junior"

U. S. Patent pending,
Canadian patent allowed
Jan. 8, 1929

The "TRIMBEY-SHEVLIN"

Capacity of "Junior" 40 tons "Senior" 80 tons G. W. per 24 hours using .065 plates.

One quarter to one third H. P. per ton.

No showers, plates always clean.

Tailings well washed and elevated into second screen without pumping.

Operates on stock up to 0.8% consistency thus requiring less pumping and fewer thickeners.

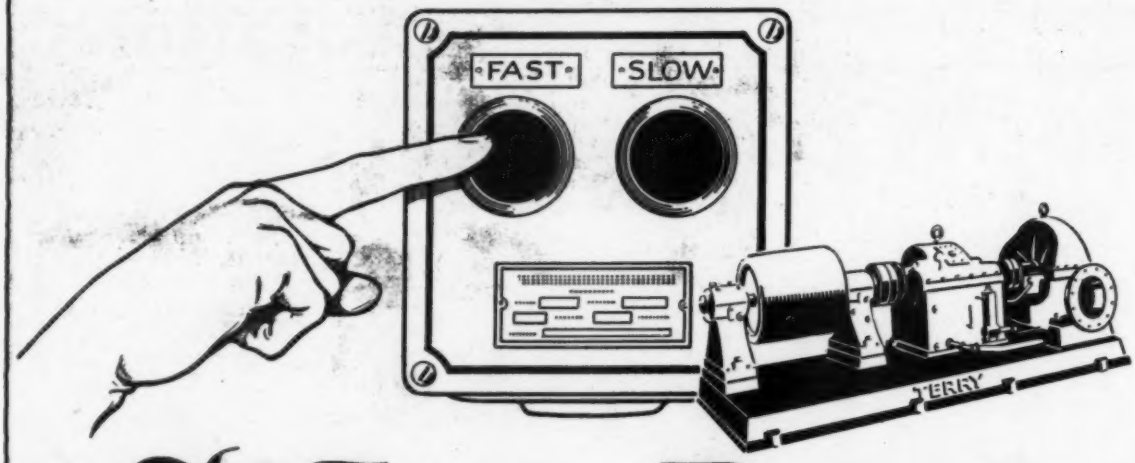
ALSO performs equally as satisfactorily as a "Second Screen"

A pulp screen which is a worthy companion to "The Trimbey Automatic Consistency Regulator" & "The Trimbey & Tibbitts Proportioning & Metering System.

TRIMBEY MACHINE WORKS, Glens Falls, N. Y.

"Made in Canada" Also

Under *Push Button* Control



The Terry Paper Machine Drive

Remote speed control is now available with the Terry Steam Turbine Paper Machine Drive.

The paper speed can be adjusted from any convenient location on the machine floor. At a press of the button the speed is altered easily and smoothly.

A Terry engineer will be glad to give you further details.

The Terry Steam Turbine Company

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THE PAPER INDUSTRY

REG. U. S. PAT. OFF.

Vol. 10 MARCH, 1929 No. 12

Research as Commercial Enterprise

Observations on the Place of Research in the Pulp and Paper Industry

By R. W. HOVEY

Technical Director of the Oxford Paper Company

THE place of research in the paper industry is at the present time a much discussed subject in the papermaking countries of the world. Invariably this discussion leads to comparison with research developments in other industries, educational institutions, private laboratories, and in governmental departments. It might be that the subject of research in the paper industry could well be discussed under the heading of "The Position of the Paper Industry in Research".

Research as such is a tremendous business in this country today. Upwards of $200,000,000 was spent in 1927 for scientific research and many millions more in what can be called research, though it is generally known as development work. We are then perhaps quite fair in wondering what is the position of the pulp and paper industry in the research industry.

Research Leads to Success

The position of the pulp and paper industry in research is largely determined by the interpretation of the industry's present and future economic position by the executives of the industry. If the executives believe that new products of marketable value are possible, that improved quality of product is attainable, that reduced costs can be secured through improved processes, that new and more economical processes are possible, and that the raw material position of the industry can be improved, they will undoubtedly attempt to accomplish these results, and the success of other industries in research has pointed the way.

This has been the position of the pulp and paper industry executive. During the past few years his appreciation of the situation has led to rapid development of research work in the industry and it is perhaps for the reason that such development has moved so rapidly that we hear so much of the place in research in the pulp and paper industry.

Research a Definite Business

Research in industry, however, is a definite business and should constitute a separate department of the industry or corporation interested. It cannot be accomplished by putting a chemist at work and expecting miracles. It might be mentioned that research exists in branches of our industry and science other than chemistry. Mechanical research deserves much more consideration than it has received in the past.

Leadership for research should be given to an executive suitably trained and experienced to see that the research work is developed along lines of value to the interested industry or corporation, that all the different aspects of research work are properly developed in relation to the principal problems, and that the industry's or corporation's problems are fully appreciated by the research workers. It is at this point that we may well discuss the place of research in our industry. In the following discussion it should be understood that laboratories, workers and their studies are those of all experimental science and not only chemical. Industry must properly understand research work if it hopes to make its research development valuable and permanent and its work of such a character as to provide a continuous supply of the required information.

Fundamental Research

From the purely fundamental side of research must come the basic data which make possible the development of new processes, new products, new

raw materials. This phase of research is the heart of the endeavor and cannot be neglected if final success is to be achieved; it calls for highly trained workers and suitable laboratories which carry on work continuously under the most favorable conditions and which are not influenced by any normal economic fluctuations in the industry or corporation's affairs. It is the long haul side of the research business, results cannot be turned out over night, it must have continuity.

Applied Research

The next phase of research might be called the applied or semi-fundamental division. Here available basic data are applied to concrete problems in such a way as to provide solutions or create improvements in processes or products. This phase of work calls for a different type of worker and laboratory. It requires the technical man who has sound training, originality, and experience in the manufacturing side of the industry so that he can put theory and practice together to secure improved operation, improved or new products and reduced costs. He should have such laboratories as enable him to carry out studies of small scale manufacturing processes and duplicate as closely as possible manufacturing conditions. Reasonably quick returns may be expected from such work.

Manufacturing Control

The next thing to consider might be called the manufacturing control phase, or that aspect of research which studies manufacturing procedure, understands its weak points where necessary data are not available, draws this data from one or both of the previously mentioned phases and provides increased knowledge for the operator to use in manufacturing. This branch of application might or should originate problems for the first or second aspects mentioned above and constitutes that part of technical work which provides quick returns to the industry or corporation. Here leadership should be thoroughly trained and experienced but the large amount of routine necessary can be carried on by men of less training.

If the foregoing divisions of research for our industry can be assumed to be real and truly represented, and we have much evidence to support this idea, how should this be applied to the pulp and paper industry?

Application of the Principles

The first phase, or fundamental work, calls for continuity of effort, highly trained men, and well equipped laboratories with every facility for contact with all branches of science and technical and scientific literature. This means a fairly expensive laboratory building and library in the average manufacturing town typical of the industry; or the housing of this work in large centers, preferably university centers, or affiliation with universities. The money involved for a co-operative effort on the part of an industry represents a comparatively small investment; for a large company a reasonably small investment for anticipated returns, but for the small company a rather large outlay. In the latter case university affiliation with careful appreciation of the principal problems seems to be the only outlet.

To summarize the first-mentioned phase of our research development, we should consider the industry providing its own accommodation through co-operative effort and placing such accommodation in university centers. For the large company we can assume it will provide its own laboratory accommodation or affiliate on a fairly large scale with a university department.

The second phase, or semi-fundamental or technical side of our research program, can best be done at the manufacturing plants of the companies in question; in semi-commercial laboratories provided with small scale equipment; or in combinations of laboratory and commercial equipment.

Latest Development

The fundamental and semi-fundamental divisions can be and should be combined or housed together in a development of the industry or large corporation. In the case of the co-operative industry development, the small company is served and this is highly desirable from the national viewpoint. We see the latest of this type of development in Montreal by the Canadian pulp and paper industry. Here the Canadian industry houses and operates a completely equipped fundamental and semi-commercial laboratory with the full co-operation of the Department of the Interior of Canada and McGill University.

The control development phase of our research must necessarily be done both at the mill and laboratory. In the large company with its laboratory at some industrial or university center, data can be made available to the mill worker for application to some definite operation and work can be requested of the laboratory by the mill worker. Generally, the mill laboratory provides the immediate essentials of man power and laboratory accommodation, with the main laboratory, wherever housed, providing more complete equipment and highly trained workers when necessary.

Research Must Be on Broad Scale

Research by industry or any corporation must not be classed as a minor development, else it will not succeed. It is true that one or two highly trained men working under suitable laboratory accommodation may show appreciable returns for the corporation interested, but nevertheless experience throughout all industries has clearly developed the fact that

research to be highly successful must be conducted on a fairly large and broadminded scale. This is particularly true of the paper industry where manufacturing processes are so varied and all branches of science are so widely used. The pulp and paper industry or any large corporation should be urged to give their research development a trial on such a scale and over such a period that the field available can be suitably covered with proper personnel and proper equipment, and should not expect a small number of trained workers with poor laboratory equipment to produce earnings out of all proportion to the investment.

Two Types of Fundamental Research

From the foregoing discussion, we cannot draw the conclusion that broad fundamental research can be housed by any one industry or corporation. The industry or corporation can carry on fundamental research and develop basic data of immediate value to its own problems. But back of this work lies the broad field of fundamental work in all branches of science which we may say is the starting point for the fundamental work of industry. This work can in most cases only be carried on by more permanent types of institutions such as universities or governmental departments, endowed societies and foundations. It becomes necessary, therefore, for the industry's executives to appreciate the importance of these often considered unrelated laboratories and to see that support for their maintenance is forthcoming. Otherwise they will suddenly find their source of basic data cut off, which in turn will slow up their own research developments or call forth expenditures for work of a general scientific nature that is very expensive for any one industry or corporation to support. It is furthermore basically wrong that work of this type be carried on by any one industrial unit or industry. It is work that is necessary to the scientific health of the world or nation and as such should be so considered and supported generally.

Proper Direction of Research

The importance of proper direction of research activities in large companies cannot be too strongly emphasized. The position of the research department should be such that its relation to the progress of the company is appreciated by the executives of the company. The executive in charge of research should be familiar with all policies of his company and with the industry at large. He should be able to appreciate the economics of the industry and plan to lead his company in development work into safe channels that fit into the economic picture. He should not lead his company to believe that research will achieve scientific miracles. Rather he should paint the picture of safe developments leading his company into sound business channels that will provide a continuous outlet for its products and dividends for its stockholders. The research executive should in addition to his scientific qualifications be a man of such experience and contact ability that he can carry his work into mill operations. Otherwise much effort will be wasted, and in many cases thrown away. Too often the research executive cannot make the necessary contact or has not the practical experience to convert his theoretical developments into practical use.

It is not the intention of this article to discuss the question of the intrinsic value of research in the pulp and paper industry. This should be realized by the industry and we know that it is realized by the developments of the past ten years. It need only be said that large economies in process, the development of new processes, new by-products and improved products are possible, and ultimately a host of new products, and there is a real need for a raw material development to replace or replenish our rapidly failing wood supply.

(See page 2162(a) for Symposium of Views on Research)

Something Should Be Done

Crocodiles Being Driven from Their Haunt on Demand of Industry

MOST any one who has spent some time at Miami, Florida, will recall having visited the Seminole Indian village south of the city and while there having seen men and boys get into the crocodile dens and tussle with the crocodiles in order to collect the coins that had been thrown to them by the spectators.

The crocodiles were all sizes, and came from what is better known as the Everglades of Florida. These Everglades cover a tremendous territory extending across the major portion of the State which has heretofore been practically a swamp, used only for the propagation of crocodiles. We were told that many colored families lived on the edge of these swamps, as did some of the Seminole Indians, and that occasionally an Indian papoose or a pickaninny was missing, in which case they surmized that the crocodiles had had an extra feed.

All of this is being changed, and while it may be hard on the crocodile to drive him out of his native haunt, the sweet tooth of his majesty, the American citizen and his lady, must be appeased, and already a start has been made to convert a large section of this heretofore great tract of waste land into the growing of tremendous quantities of sugar.

Possibly to the average individual, it would seem like a fairy story to tell him of this waste land being changed over to produce a larger quantity of sugar than at any other point in the United States. This is exactly what is to be done, and in fact the work has already been started. On January 14, 1929,

Governor D. E. Carlton, of Florida, started the machinery in the first plant of the sugar company, at Clewiston, Florida, which marks the beginning of a combination of agricultural and manufacturing developments that has tremendous possibilities.

B. G. Dahlberg of Chicago, president of the Celotex Company who is at the head of these developments in Florida, stated that in the next few years he expects that Florida will be growing vast quantities of cane, enough to turn out possibly 450,000 tons of sugar per year. This is all new for Florida, and is the beginning of its entrance into the growing of sugar cane and the manufacture of sugar. The world's production of both cane and beet sugar in 1927 totaled 27,000,000 short tons, and the United States produced about 217,000.

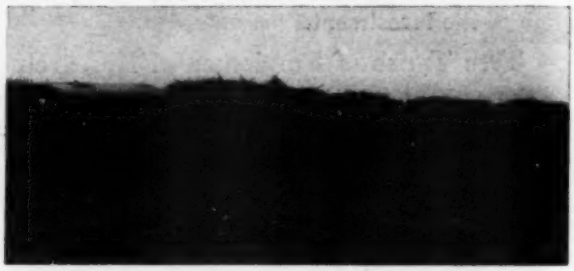
The interesting part of this project to the paper industry is the ultimate intention to utilize the waste cane after the juice has been extracted in the manufacure of insulation board.

The Celotex Company, as is well known in the industry, has a large plant now manufacturing great quantities of insulation board, known as Celotex. As soon as this Florida sugar plant furnishes enough waste to keep an insulation board mill running, and there is a sufficient demand for the product, a board mill will be built in connection with the sugar plant.

Mr. Dahlberg's attention was originally directed to the Everglades for the raising of sugar cane and a source of raw material for the manufacture of insulation board by reports that the Federal Department of Agriculture had selected this section as the site of a cane breeding and experiment station. The reports from that department said, "There is practically no other body of land in the world that presents such remarkable possibilities of development as the muck land bordering the southern shores of Lake Okechobee. With a depth of soil of perhaps eight feet, and an extent of nearly a half million acres, it affords promise of development which reaches beyond the limits of prophecy. It may be said, then, with confidence, in the region of Lake Okechobee the land which may be recovered for sugar making purposes has all the advantages of the climate of Cuba".

Day and night operations preparing Everglades land for sugar cane production

The government experts were not interested in anything more than the growing of cane for sugar.



Gathering sugar cane from Everglades land

The business men saw the possibilities beyond this and about four years ago they began the work of draining and experimenting with sugar cane on the Everglade land, which over a period of years has grown an average yield of from 40 to 50 tons of sugar cane per year, some of which reaches as high as 16 to 20 feet. It produced a high per cent of sugar and a very satisfactory grade of begasse, which is the refuse after the juice has been taken out, and which has been used by the Celotex Company in manufacturing insulation board.

The first factory has just been completed at Clewiston, and is the first of a chain of sugar mills to be built as fast as cane production warrants, until a total daily grinding capacity of 30,000 tons is attained, according to the company's plans. The new mill has a grinding capacity of 1500 tons, and this will eventually be enlarged to turn out 7500 tons a day. Another factory will be built this year at Canal Point. Twelve thousand acres of sugar cane are to be planted this season.

The accompanying pictures will give some idea of what is being done at this time. It is stated that 75 of the powerful tractors shown in the pictures are at work with other needed machinery day and night breaking up the drained swamps, which is the first move in finally preparing 125,000 acres of this swamp land to produce sugar and board.

In the Clewiston section a levee thirty-one miles long, with 138 miles of canals and ditches is backed up by huge pumps with a capacity of 180,000 gallons per minute, which take the water out of these canals and in this way have already provided control over the 35,000 acres. Similar methods of drainage with pumping plants are being installed at other points.

Pictures used in this article by courtesy of The Canadian National Railways

Patrick Gets Out the Drive

An Inspiring Story of the North Woods

By WILLIAM MacMILLAN

THOUGH they were right in the middle of the winter's operations, the Northern Logging Company's main camp at Caribou Crossing dozed and purred lazily in the warmth of the noonday sun. Rows of pulp logs were piled carelessly along the rusty tracks, and valuable hauling machinery lay scattered about the yards. Inside the tiny weather-beaten office a freckle-faced French boy sat with his feet up on a rickety desk and both hands clutching a paper covered novel. Red fiction is the same in any language, it seems, and so engrossed was the lad in the desperate death-defying leap of his hero from the cliff-top that he quite failed to hear the thud of heavy boots on the stairs.

"Good day, son, where's the boss?"

His eyes staring out of his head at the terrible plight of his hero, the book clutched tightly in his hands, the youth, too excited to even give the questioner a look, jerked a stubby thumb over his shoulder, "In there, M'sieu, having a snooze."

The boss of the Northern Logging Company, a tall black bearded man, didn't relish being disturbed, and he told the inquiring stranger so in no uncertain terms.

"Sorry to shorten your beauty sleep, Mr. Lestrange," boomed the newcomer, a small man with an amazingly powerful voice, "but I have a note here that you might like to read."

What the angry manager read in the note obviously didn't soothe his ruffled feelings any, because his face flushed as he got the full meaning of the letter. For a second, it seemed almost as if he was going to tear it into a hundred pieces. Controlling himself with an effort, he extended a grimy hand.

"Welcome to our city, Mr. Mullaly."

"Mullarky, if you please," boomed the other with a smile, "With a Patrick before it."

"Fine," returned the manager, with forced gaiety. "The French and Irish always get along well together."

"I wouldn't like to bet on that," ejaculated Mullarky reflectively. "I remember licking two Fren—"

"Of course, of course," hastily interjected Lestrange. "That was just a little joke of mine. Now permit me to introduce the rest of our office staff. Onisime, this is our new manager, Mr. Patrick, er, er, Mullal—"

"Mullarky, Mullarky," barked the little Irishman, gripping the boy's shyly extended hand, "and I'm jist wane o' the boys."

To tell the truth, the new manager wasn't altogether unexpected. Having been operating throughout the winter at the expense of a thousand objecting creditors, the logging outfit had been picked up in the last few weeks by old Simons of the Consolidated. There were no half way measures with the new owner. Summoning Patrick Mullarky from the depths of his beloved Maine woods, he had sent him to take over the affairs of the latest acquisition, size up its potentialities, and report back without loss of time.

Patrick Mullarky, it may be stated without fear of contradiction, would never have won a prize at a beauty show. So unobtrusively had he dropped off the limited that night, none of the loafers about the tiny platform had given the ugly little man a second look. Before noon the next day, however, the entire outfit knew that a new man was on the job.

As became a man of pride and unblemished reputation, of course, Mr. Lestrange was peeved about the whole thing, and took pains to tell the Irishman so.

"Carry on, Mr. Lestrange, carry on," growled Mullarky, "while I jist nose around a bit."

The new manager found plenty of things to keep him busy. Shutting his eyes to the shiftless methods of the entire outfit, and apparently unconcious of the stagnation of the winter's cut, he proceded to make a complete and exhaustive physical inventory of the standing timber. What he found he kept to himself, of course, to the intense irritation of the ex-manager.

"Counting the trees again to-day, Mr. Mullarky?" he sneered one morning, just as Patrick was climbing into his red burlo.

"Maybe," he chuckled in reply, calmly tucking the robes around his legs. "It kind o' irons the wrinkles out o' a man's brain."

After supper that night, long after everybody else seemed to have turned in, Mullarky constructed, for the general manager's benefit, the most enthusiastic telegram of his career. "Best limits in Eastern Canada," the wire read. "Sell the cut."

When Mullarky opened the office door the next morning, the boy, Onisime, handed him the yellow envelope bearing old Simons' reply—"Your wire confirms our first estimates," ran the telegram. "Better come home."

Throwing himself into his chair the woodsman read and reread the message a dozen times. What in thunder did the old boy mean, anyway? If the limits were as good as they had first estimated them to be, why come home? Hadn't old Simons been worrying for the last six months, too, how they were ever going to fill their contracts with the big Anglo Paper Mills?

Once Patrick Mullarky got his teeth into a problem he stayed with it to the end. Throughout that entire day he worried the situation to shreds, as it were, finally winding up by rousing the station agent out of his bed long after midnight.

"Say, Mister, did you send a message to the Consolidated Pulp Company last night?"

"Suppose I did," growled the sleepy man peevishly, "that's no excuse for you to wake me up just to tell me about it. Anyhow," he added angrily, "it would be on file."

"That's exactly what I want to see," boomed Patrick, slipping a sturdy boot in against the closing door and hooking a finger in the man's coat, "and no time is better'n the present."

Telegrams weren't so common at Caribou Crossing to make it difficult to find the required copy. And though the confused operator's nervous fingers make quite a task of it, he finally handed a well-thumbed sheet to his relentless inquisitor. Mullarky, however, was quite unprepared for the message he read thereon. The carbon copy of the message undoubtedly sent out over his signature—"Worst Limits in Canada. Stop the cut."

For a second, Patrick thought of taxing the surly operator with having tampered with the message. Then realizing the hopelessness of such a procedure, he thrust the sheet into his pocket and made for the door.

"In future," he growled over his shoulder, "be sure to send my wires as you get them."

Though usually a sound enough sleeper, Mullarky tossed and turned for hours that night, puzzling over the faked telegram, and mentally finger-printing the three persons likely to have done it. The boy, Onisime, he finally dismissed from his mind. The station agent and Lestrange, however, certainly would bear watching. Why were they so anxious to get him away from the job? And when he eventually fell asleep, it was to dream of being pursued over a sea of sinking logs by a whole army of bearded Frenchmen.

The succeeding days found the new manager nosing about in every nook and corner of the limits. The absurdly small log-cut fairly appalled him, and it was all he could do to keep from bawling out the various foremen he encountered. The treacherous plotter continued to lie low, however, and gave no sign of being at all interested in his continued presence.

Bundled up in his little red burlo, and soothed by the jingling bells, Patrick Mullarky was turning over and over in his mind the various details and incidents of the last few days when the horse suddenly threw himself back on his haunches and pawed the air with snorts of terror.

With the true lumberjack's respect for horses, Mullarky climbed out of the burlo and did his best to soothe the excited beast. Though it was fairly dark, he could see the tote road quite plainly, and he couldn't find anything unusual about it. Only when he had secured the excited roan to a tree, however, and stamped over the road himself did he realize that a deep trench had been excavated under the corded logs. Had the horse once stepped on these carefully replaced logs he would have been catapulted to the bottom of the pit.

His hands clenched in his mittens and his lean jaws set in a straight line, Mullarky examined the snow beside the road. And when his sharp eyes

detected the imprint of a snowshoe, he whipped his own webs out of the burlo, sent the horse galloping homeward with a slap on its flank, then struck off into the woods.

The night was blacker than the ace of spades when the perspiring Irishman came out at the end of the trail—his own stable. Furious at the treachery of somebody close to him, he was about to push open the heavy door when the murmur of voices came to his ear. Slipping off his snowshoes he crept around to the window and peered inside. Huddled about a dimly burning lantern were three figures, and though he couldn't remember ever having seen two of them before, there was no mistaking Lestrange's bearded face.

"You play us for suckers," growled one of the strangers in an unmistakable French accent. "First, you say this fool Irishman go home. Then you say he get hurt, maybe."

"He'll get hurt all right," rasped Lestrange. "He may be hard to get rid of, but I fixed him this time. He wont come back in a hurry."

"Diable!" hissed one of the men, "what is that?"

"Nothing but the Irishman's horse," laughed Lestrange triumphantly, flinging open the door. "The little fool won't bother us any more."

For a long hour after that, Mullarky crouched under the window and listened to the villianous trio. Assured by the confident Lestrange that they had in all likelihood seen the last of the interfering Irishman, they flung all caution to the winds and argued their plans in detail.

It was a cleverly conceived plot. And the listening woodsman couldn't help but admire the plotters' nerve as they discussed how the Consolidated's greatest rival, The Milo Paper Company, had, through the medium of these two Frenchmen, bribed the Northern Logging Company's erstwhile manager to depreciate the value of the limits, cut down the cut by all possible means, and, finally, to so retard the spring drive that the Milo logs would shoot down the river first and catch the market at its peak.

Finally, with Lestrange's voluble assurance of his loyalty in their ears, the Milo spies extinguished the lantern and slipped out of the stable, almost brushing against the quivering Mullarky as they tied on their snowshoes before creeping off into the darkness.

Patrick enjoyed Lestrange's start of surprise at sight of him the next morning, but he gave him no indication as to whether or not he had the slightest suspicion of who had tried to murder him. His plan of action thoroughly well defined now, it was no part of these plans to nail the culprit yet. Not daring to trust the rascally station agent with another telegram, he slipped a letter into the grimy paws of the limited's engineer, one night, and asked him to mail it at the next stop.

Things began to happen soon after that. Newcomers, big raw-boned farmers with bronzed, laughing faces, applied for jobs and were taken on as quickly as they appeared. And though the astute little Irishman passed these men without batting an eyelash, he actually knew every last mother's son of them, and could call them by their first names. Quickly, then, word was passed around from camp to camp that saw and ax men were expected to double their output till the end of the cut.

Enthused by Mullarky's booming voice, and unconsciously urged on by the example of the lanky newcomers cleverly placed at strategic points, the French Canadian lumberjacks, mighty men with saw and ax, set to work with a will. While Mullarky, grimly determined to take advantage of every last remaining hour of propitious weather, banished the treacherous Lestrange from his thoughts and applied himself to the work he loved best of all. By the time the first thaw swooped down on the woods, no less than a million feet of pulp logs were perched on the riverbanks, waiting for free water.

The big break-up came a few days later, and it was then that the lanky farmers with the laughing faces proved their real worth. Experienced river men, they crammed the stream from shore to shore with pulp logs. Then, when the piling waters from the hills behind swept the last ice-barrier aside, they nursed the whole great mass downstream with a cunning that drew exclamations of admiration from the watching lumberjacks.

The days, and nights too, were hectic ones after that, every waking hour being crammed with excite-

ment and adventure dear to a real woodsman's heart. Sleeping, eating and working with the sweating, cursing river men, Pat Mullarky wielded as active a peevie as the best man there.

It took the best part of a week to negotiate the twists and turns of the tributary stream feeding into the main river, and when word was whisked back to the toiling boss that the van of the drive was being held up by booms somebody had strung across the outlet, he leaped across the stationary logs and scrambled up the steep bank with his heart in his mouth. Had the treacherous Lestrange gotten ahead of him? Was he to lose out just when the end of the fight was near?

It was quite a climb to the top of the bluff, and the Irishman's hob-nailed boots slipped and scraped on the smooth rocks, but when he straightened his aching spine he couldn't suppress the groan of disappointment that broke from his lips at sight of the mass of moving logs jammed from shore to shore of the big river. Lestrange and his spies had done their dastardly work only too well—the Milo crowd had won the "water."

The Will that Overcame Obstacles

As Patrick Mullarky stood on the crest of the bluff that day and watched his rival's logs go surging down the river, to catch the pulp market at its best, the mounting anger in his heart momentarily smothered his usual ingenuity. Now he knew why Lestrange, the logging company's first manager, had cramped the winter's cut and depreciated the valve of the limits. That telegram to his general manager, too, had undoubtedly been changed by the villainous Frenchman. And it was clear that Lestrange had been doing all this in order to sicken the new owners, The Consolidated, with their purchase. In imagination, Mullarky could see the smile of malicious delight on Lestrange's bearded face as the limits of the Northern Logging Company were knocked down to the highest bidder—himself.

The gloom could almost have been cut with a knife that night, as the farmer friends that Mullarky had hastily summoned to his help discussed the impassé about a roaring fire. The idea of a competing gang—a French one at that— beating them to free water didn't appeal to their sense of humor at all. And more than one husky made the suggestion that they raid the other outfit just on principle, as it were.

Patrick Mullarky listened to the hot arguments in gloomy silence. So far he hadn't told those loyal old friends of Lestrange's treachery and the dastardly attempt on his life. As a matter of fact, things had come to such a serious pass now that he was positively afraid to tell them for fear of what they might do.

"They've trimmed us, boys," growled a broad-shouldered river man with an air of finality, "and I guess it's up to us to sit down and wait."

"Wait, nothing," snapped a younger man impatiently, "there surely must be some way of queering that gang's little game."

"There is, lads," suddenly interrupted Mullarky, leaping to his feet with a tense, eager face. "How far from here is the place they call Thunder Curve?"

"Two miles—by water," volunteered somebody.

"And over land—?"

"Not more than half a mile, I guess," growled another.

"Holy Mackerel!" exploded a young woodsman, grabbing the boss's arm in excitement, "a sluice?"

Mullarky nodded. "It'll be a tough job to get it out over that ravine, though I guess we can make it all right."

"You can bet your last dollar on that, Pat," roared a deep-chested giant. "Let's go."

As the experienced woodsman had anticipated, bridging that quarter-mile ravine with a sluice proved a man-sized job. Great trees had to be felled and dragged, and vast quantities of heavy timber hoisted high in the air, but Mullarky's men were on their mettle. Taking no note of time, and making use of all their native ingenuity, they tapped the stream with a wide-mouthed sluice that weaved across the ravine like a giant snake and finally buried its crude nose in the waters of the big river.

Qualified engineers couldn't have done a better job. The whole thing was thrown up in such marvelously quick time that Mullarky's men were actually stringing booms across the river before the first Milo log came bobbing into sight.. A triumphant yell from the gang at the intake of the sluice as they cleared away the temporary dam, and the logs began bumping down the narrow wooden channel. By a clever bit of work, Mullarky's logs had cut the other outfit's drive, and won free water.

Though elated at the success of his ruse, unethical and all as he know it to be, the little Irishman knew from the depth of his long experience that even yet final victory might be snatched from his grasp. And he wasn't at all surprised to find the Milo River boss, a skinny, leather-faced woodsman, waiting for him at camp.

"You have worked fast, M'sieu Mullaly," began this individual with a smirk.

"Mullarky, my friend, Mullarky," barked the little Irishman, "and speed, if you crave to know it, is me middle name."

"I must remind you that we have the water first."

"Up here, maybe," chuckled Mullarky, "but not below the curve."

"The river is ours by law, M'sieu," insisted the man furiously.

"Just try and take it, Mr. Santa Claus," retorted the Irishman provocatively, "and our reception

committee will be on hand and glad to welcome ye."

To say that things looked black just at this juncture would simply be distorting the truth. As a matter of fact, when the listening woodsmen learned the nature of the Frenchman's errand, they made the night hideous with their yells of delight, and the furious river boss finally found himself being escorted down the hill by a crowd of howling dervishes.

Back by the fire, however, Patrick Mullarky hugged his knees and did his best to lay out his plans against the inevitable conflict. And it might be mentioned here, that in spite of what he had at stake, the fiery little Irishman's blood began to course madly through his veins, as, with the genius of an old campaigner, he laid out a plan of action that he was confident would bring defeat and discomfiture to the enemy, should they attempt to rush the sluice.

A few hours later, therefore, found the farmer-river men armed with pick-ax handles and patrolling what might be described as the pivotal points of the line. It was pitch dark by this time, and the clatter and banging of the Mullarky logs racing through the sluice must have carried clearly to the furious outfit in the valley.

As the night dragged on without any sign from the invisible enemy, Mullarky figured, with keen disappointment in his heart, that the Milo gang had decided that discretion, after all, was the better part of valor. Grumbling to himself at the decadence of the modern river men, he was turning to the fire in disgust when there came sounds of a slight scuffle in the darkness somewhere near the foot of the sluice, and two brawny farmers finally emerged with an exhausted boy in their clutches.

"Onisime!" exclaimed the boss in astonishment as the dancing firelight lit up the boy's bruised face.

"Quick, M'sieu," gasped the lad. "Lestrange is put dynamite on the logs upriver."

"Peters, Bates, Perkins," roared Mullarky. "Comb the river till ye find the varmints."

Then, without even waiting to see if these stalwarts were following, he seized a peevie and raced up the river bank.

As the little Irishman tore madly up the trail, stumbling over stumps and tripping over branches in the pitch darkness, his blood ran cold at the fiendish extremity of the man who would plant explosives in moving pulp logs. A picture of his gallant friends—Carter, Worth, and Samson, for instance—standing at the mouth of the sluice with death-laden logs under their prodding boat hooks kept rising up before him, and he gripped his peevie handle in inarticulate fury.

Lestrange was balanced on a twelve-foot log, binding sticks of yellow dynamite about a peeled pulp log, when the Irishman hurled himself upon him like a wild cat. Dropping the explosives with a snarl, the bearded Frenchman turned to meet the attack of his diminutive adversary.

From the standpoint of weight, height and reach, the little Irishman was no match for Lestrange, and shouldn't have had a chance in the world. What he lacked in size and weight, however, he more than made up for in speed and agility. With the deadly explosives scattered about under their hob-nailed boots, the two river men—one with a boat hook and the other with a peevie—leaped and lunged at each other with savage ferocity.

Seemingly unconcious of the fearful things about their feet, the men fought there in the Stygian darkness like madmen. A single well-aimed thrust would have been enough to send the recipient reeling into the bitterly cold water. One poorly judged jab of either iron-shod weapon, and the whole surrounding world was likely to leap into the air in a sheet of flame. Slowly, but surely, the big man's weight and strength began to tell. Mullarky began to give ground. Slowly at first, then more rapidly as the Frenchman, gaining confidence, began, after the manner of his kind, to taunt the little man before him. Patrick, however, had no breath with which to frame a reply. Grimly realizing that a cold ducking, even death, yawned at his feet, he thrust and parried with both hands about the shaft of his cumbersome weapon.

Such an unequal battle couldn't last forever, and just when it seemed to the gallant little Irishman that his weary arms could no longer carry the weight of his peevie, the river men swarmed down upon them.

"Duck him," growled a voice as rough boots scraped over the logs, and Mullarky was thrust rudely aside.

"Hold on, boys," he gasped, "there's dynamite under your feet."

"Devil take the dynamite," roared a huge woodsman, looming up in the darkness like a colossus. "We want this fellow, Lestrange."

It was a wonder the infuriated river men didn't hurl the treacherous Lestrange head foremost into the river. Indeed, if it hadn't been for Mullarky's breathless protests, they probably would have done so right there and then. Could the exhausted Irishman have guessed their sinister intentions, though, he probably would have even urged them to toss the man headlong into the river.

"The sluice," suddenly whispered a voice.

"The sluice," shouted another.

"Hurrah, the sluice," roared the crowd. And Mullarky's heart almost stopped beating when he realized the dreadful portent of that cry. Deaf to his entreaties, they dragged the cringing spy along the river bank to the mouth of the great sluice.

If ever a man prayed for an interruption—a

cyclone, earthquake, or something—it was Patrick Mullarky. Sick with horror at the awful thing they seemed grimly bent on doing, and barely able to keep up with the long-legged woodsmen, he hurried along behind them.

It was darker than the inside of a nigger's pocket, up there on the bluff, and the excited woodsmen lost no time in hurrying their limp prisoner to the intake. Suddenly from the valley below, high and clear above the thudding of racing logs, came the sounds of conflict.

"There's trouble down there, lads," growled Mullarky, seizing upon the interruption as a drowning man seizes at a straw.

"Let's go," snapped somebody. Whereupon, without giving their cringing captive another thought, the whole gang rushed down the hill, leaving Mullarky and the Frenchman alone on the cliff-top.

For a second, Lestrange, his shirt half torn from his back, and a red welt across a cheek, blinked at the Irishman through bloodshot eyes. "You do, this, after what I have done to you?"

Mullarky nodded. "You're a good woodsman, Lestrange. You're just in with the wrong crowd."

"I thank you, M'sieu," whispered the Frenchman hoarsely. "And may I, as one woodsman to another, wish you au revoir?"

Slowly Mullarky extended his hand, and as the hands of Frenchman and Irishman met, shouts of victory came floating up from the ravine.

The last resistance had been overcome and nothing now could keep the Consolidated's logs from reaching the eager market.

Lessons in Paper Making

Lesson XXVII—The Theory of Color, Part II

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This article is the twenty-seventh of a series of lessons in practical paper making, appearing in The Paper Industry by arrangement with the Champion Fibre Company, Canton, N. C. These lessons are a part of the general education course, conducted by this company under the direction of Mr. J. Norman Spawn, educational director.

IN THE preceding lesson, a discussion of the wave theory of light, we found white light to be the simultaneous sum of ether waves of varying length and vibration frequency, created and radiated by the molecular vibration of the burning sun matter. If then, we change, by any means whatsoever, this simultaneous vibration frequency of the ether waves comprising white light, we obtain a result other than white light **and create visibility.**

An ordinary beam of light, called white light, is made up of all the different wave lengths of all the different colors, vibrating so as to **keep exactly together in their travels.**

The resistance offered by any object to this travel of the light beam intercepts the component color waves and changes the vibration frequently so that they do not travel exactly together; in other words, the beam of white light is split up into its separate component parts. All of these color waves are refracted, some are absorbed and some are reflected, dependent on the density, coloring and reflecting qualities of the intercepting medium.

The commonest experiences of seeing are those of **visibility** or **intensity** of light, and those of **color** or **quality** of light. When light strikes a perfectly flat, highly polished surface such as a high quality mirror, then light coming back from such a surface reaches the eye as though coming from a distant object instead of from a reflecting surface. This is known as **regular** reflection, and scientists have established two laws which explain this to us: (1) The incident, or entering ray, and the reflected, or leaving ray, travel in exactly the same plane. (2) The angle of incidence is equal to the angle of reflection.

Because we are so accustomed to seeing colored objects, and in our papermaking to handling dyestuffs with a scoop, it is difficult to realize that color is a sensation; it has no material existence. The term "yellow light" means, primarily, a particular sensation; secondarily, it means the physical cause of this sensation, that is, the registration on the retina of the eye of a train of ether waves of a particular frequency—in this instance, yellow, 510,000,000,000,000 per second.

The various sensations which light rays of different wave lengths give to the eye is color. The actual color is due—first, to the **kind** of light which **strikes** the object; second, to the kind of light which the object **reflects** or transmits to the eye. Thus, a sheet of paper which we see as red, simply means that of the seven color rays contained in a beam of white light, six—orange, yellow, green, blue, indigo

and violet, are **absorbed** by the coloring matter we have added to the paper, and the seventh, red, can **not** be absorbed by this particular coloring matter and is, therefore, **reflected** to the eye. In other words, using a nice big definition to make it all the more mysterious, "the ether wave length of the vibration frequency, which when intercepted, refracted and reflected indicates red, has, by this action, been made visible to the eye".

Our beater room foreman while having difficulty in getting the desired shade recently, expressed the matter much more tersely and to the point. He said, "Harry, some o' them damn shiners you was telling us about are missing". True, oh King! In this particular instance, the formation of the sheet was not sufficiently close and the desired "shiners" had filtered through the paper and were **not reflected.**

Vision

Just a word apropos the kind of light which **strikes** the object. As pure white light is the radiation of the burning sun matter, then pure sunlight, or man's imitation of pure sunlight, a "daylight lamp", is the only kind of light we should examine our shades under. Very occasionally we go shopping with the wife. Of course, in the sanctity of the lingerie and hosiery departments we stand at a respectful distance and survey the stage settings. Lights shaded with rose-colored silk, counters covered with royal purple, and here and there casual, oh quite casual drapes of delicate orange. Madame examines the articles which she naturally and I eventually are interested in, and exclaims: "Isn't this a beautiful shade? Yes, I'll take that". Then when she gets it home, the article looks somewhat different. Tricks in every trade, boy; tricks in every trade.

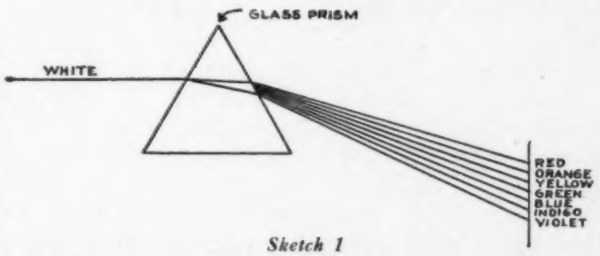
Light is color, and it is the separation of the color rays in a beam of white light which makes color visible. Perhaps the ultimate in invisibility is to imagine a black cat in a negro's arms hidden in the depths of a coal mine. Yet, suppose for a moment, we bring Mr. Negro and his cat to the surface and study them. Suppose we find he is a "real swell" colored boy dressed in a grey suit with a broad green stripe, his shoes a bright "yaller" and his tie a thing to create envy in the breast of the gentleman who designed Joseph's coat of many colors. To top him off, suppose we give him a cinnamon brown "derby", and as a last glorious touch, suede gloves. We mustn't forget the cat; a red ribbon around her neck, and to make this simile hold good, a blindfold over her eyes.

In the bright sunlight, let us feast our eyes, if the shock be not too great, on this riotous ensemble of color, then into the cage we go and down into the blackest corner of the coal mine. Alas! Our gorgeous creation is no longer visible, the ether waves of light have been refracted, absorbed or reflected by the dense earth substance. Not even the tiniest ray succeeds in penetrating the depths of the coal mine to be intercepted by the substance matter of our ensemble of nigger, clothes and cat. The cycle which culminates in **vision** has **not** been completed.

From the sun to the grass under our feet, a mere trifle of some 92 million miles, seven rays of color merged into a beam of white light travel at the rate of 186,000 miles per second, carefully assorted by the alchemy of nature so that a mixture of the yellow and blue rays forming green are reflected and complete their journey by coming to rest on the retina of the eye, **thus creating vision, a perception of a color.** Christian, fundamentalist, evolutionist, what you will, it is at least something to think about. Ho-Hum! We are getting on the wrong track. It is permissible to philosophize a little, but a papermaker should never venture to moralize.

Refraction

The rainbow is a solar spectrum on a grand scale. If you stand with your back to the sun and look upon the falling rain, you see this magnificent phenomenon as the result of refraction, total reflection, and dispersion of the sunlight by falling raindrops. We do not need to wait for a rainbow, however; we



Sketch 1

can arrange a little experiment for the class room and make a little rainbow of our own. Cover up the windows with sheets of heavy wrapper, then in one of these improvised shades cut a slit about two inches long and one-quarter of an inch wide. Through this slit will shine an isolated beam of sunlight. Arrange a desk or a table so that the beam of light falls directly on it. Using a glass prism, one of the glass drops from an old-fashioned chandelier will do, manipulate the prism so that the beam of light strikes against a sharp edge. On the opposite wall appears the beautiful band of colors, the spectrum. The beam of white sunlight has been **bent** or refracted by the glass prism, but the **violet ray has been refracted most and the red ray has been refracted least.**

We remember from the tables in our last lesson that the red ray is the longest of the color rays with the lowest vibration frequency, and the violet ray is the shortest with the highest vibration frequency. When intercepted by a refracting medium, as in the experiment with the glass prism, the short waves

are **more retarded** than the longer ones; hence, they are more refracted or **bent. This is the cause of dispersion,** and is the reason we see the separate colors of the spectrum in the order in which they appear, red, orange, yellow, green, blue, violet. The violet merges with the indigo and purple. Thus we see that each wave length has its own refractive index, or, since vibration frequency corresponds to color, every simple color has its special refractive index.

Just a few more words about the refraction or bending of the color rays, because it is the **cause** of color ray dispersion. We, as papermakers, are more concerned with the **absorption** and **reflection** of colors than with refraction, yet, as we shall see, the laws of refraction also affect the color of the sheet of paper in relation to the **formation and finish we obtain during the manufacture of a sheet of paper.**

We can use a homely experiment to make clear the laws of refraction. Take a glass of water and place a lead pencil in a slanting position in it. The pencil will appear to be **bent upwards toward the perpendicular.** If we place the pencil in the water in a perpendicular position, the pencil will appear to be **shortened.** When passing from a lighter to a **denser** medium, as from air into water, a ray of light is refracted **toward** the perpendicular. Conversely, when passing from a denser to a **lighter** medium as from water into air, a ray of light is refracted **away** from the perpendicular.

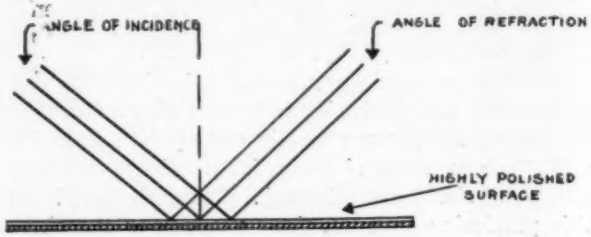
In the phenomena of the rainbow, we have a **double refraction** and **total reflection.** None of the color rays are **absorbed** by the drops of rain water. The sunlight enters the rain drops and the color rays are refracted, then reflected from the back of the drops of water and again refracted as they **leave the water drops. Thus we perceive the spread of the solar spectrum, each color ray bent in ratio to its own wave length and vibration frequency and in a direction governed by the density of the refracting medium.** The angle formed by the **incident** ray and the perpendicular or normal, is called the **angle of incidence:** the angle between the **refracted** ray and the normal is called the **angle of refraction.**

Reflection

Now let us review for a moment the application of these laws to the reflection of color from the surface of a sheet of paper.

Sketch 2 represents a sheet of paper of short fiber, well closed up to offer as smooth a surface as possible, a proportion of clay in the furnish, and a water finish with all the stack weight available. We would, therefore, have a very smooth surface with a superimposed gloss offering an **even reflecting surface.** Such a surface would most nearly approach the reflecting qualities of a mirror. As we know, the angle of incidence for regular reflection is equal to the angle of refraction and with such a surface we would appear to **have great depth of color equally all over the surface of the sheet.**

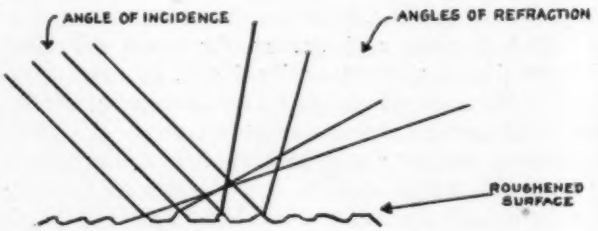
Sketch 3 represents a sheet of paper with a roughened surface, or, better still, a mottled sheet of pre s board. The angle of incidence is the same,



Sketch 2

but the angle of refraction is diffused all over the sheet so that we see high spots and low spots in the paper. The high spots would show **depth** of color, while the low spots would show much lighter or greyer.

The difference between a handmade sheet from the prepared stock in the beater and the same stock passed over the machine with a water finish is about



Sketch 3

four shades. The water finish and the weight of the calender stack **close up the formation of the sheet,** so there is **less filtration of the light beams through the paper; there is more nearly total regular reflection and we obtain the full value of the dyestuffs we use.**

A lightweight sheet of paper composed of the same furnish never shows as **deep** as a heavyweight sheet; there is **more** filtration of the light beams through the sheet. If we look at the edges of a stack of paper fresh from the cutter, we can at once detect the slightest difference in the shade; the edges do **not filter** light beams through, they reflect the true color value.

One of the biggest troubles experienced in making the cheaper grades of colored paper on a fourdrinier machine is "two sidedness", the wire side showing a lighter color than the top side. Of course, the suction applied to the wire side has something to do with this, particularly if a poor grade of dyestuff is used. The pressure of the dandy also tends to bring the color more to the top side. There is one

other operating factor, however, which plays an important part when viewed in the light of the laws of refraction, and that is the **graininess of the wire side of the paper if the stock is too free.**

We know that under these conditions the fibers settle very early on the wire, the majority of them never coming under the influence of the shake and forming in the direction of flow. As a consequence, there is a decided difference in the formation of the two surfaces of the paper and an equally decided difference in the refraction of light and the reflection of color from the two surfaces. We have reverse presses and naked fourth presses to help us make the two sides of the paper more nearly equal in texture, but **that is only a help, it is not a cure. If the sheet does not leave the wire right, there is nothing else on the machine that can make it exactly right.** The best bet is to slow up the stock a little more; the fibers will be kept in suspension a little longer; they will come under the influence of the shake a little more and **the wire side will be more nearly equal in texture, finish and reflecting qualities with the top side.**

Primary and Secondary Colors

Now that we know a little about how the colors of the spectrum are "sorted" out, suppose we discuss for a moment the order of this "sorting", and what happens when "them there shiners get mixed up a bit".

The red, the yellow and the blue are "pure" colors and are known as the **primary colors.** Now consider the order of their placing in the visible spectrum. First, we have the red, then the orange, and then the yellow. **The orange is a combination of the red and the yellow; it is a secondary color to the two primaries, red and yellow.** After the yellow comes the green, then the blue. **The green is a combination of the yellow and the blue; it is a secondary color to the two primaries, yellow and blue.** Next comes the indigo, violet and the purple, all shades of violet. **These shades come between the blue and the red, and blue and red make purple.** The shadings from indigo to purple are secondary colors of the two primaries, red and blue. We, therefore, get the following table:

Primary Colors	Combination of Primary Colors				Secondary Colors
Red	**Red**	plus	**Yellow**	equals	**Orange**
Yellow	**Yellow**	plus	**Blue**	equals	**Green**
Blue	**Blue**	plus	**Red**	equals	**Purple**

The secondary colors in each case are placed between a pair of primary colors, and that brings us to a most important point we cannot see in a rainbow—**the solar spectrum is a complete circle.** We see the rainbow as a half circle, yet color waves travel in concentric rings. It is not the purpose of this article to discuss Huygen's theory of wave motion; let me instead recommend to my readers the purchase of a good book on physics, an earnest study of these wonders of nature. Circles, circles and still circles. The sun, the moon, the stars, the earth, from the greatest mass of substance matter to the electrons and the intangible ether waves, yes, to go from the sublime to the ridiculous, even to the little puppy dog chasing his tail. Perhaps even this is symbolic of life—who knows? There we go again, more fundamentalism with a little dash of evolution—it's darned hard for a poor papermaker to be a christian.

Let me drive this one point hard home and I am through. The solar spectrum froms a circle, each color ray merging into the next, the combination of any two forming a separate color. Thus, we have three primary colors, the red, the yellow and the blue and four secondary colors, the orange, the green, and the indigo-violet-purple combination. One last word of advice. The reading of these articles must not comprise the **whole** of your study of these subjects. I can only touch the merest outline. Study and **practice.** Train the eye to differentiate between the closest mixture of colors so that you can at once discern the slightest change in shade or tint.

In the near future, this color subject will be dealt with further. Strengths of dyestuffs, combinations and formulae to produce definite shades, etc. Next month, however, at the request of many of my readers, we are going to commence a series on cylinder machine operation. This series will be supplemented monthly by questions and my answers on fourdrinier operation so that both branches of the trade will have something which I hope will prove of interest.

To the seven readers who have sent me queries during the past few weeks, I owe an apology. Due to pressure of work, I have been unable to answer your letters. You will receive an answer very shortly. For the same reason, the question and answer column is vacant this month. However, I know my brother papermakers will "oxcuse", the darned things "hay out" once in a while. Papermaking is either all sugar or else sour as green apples. **In this it differs from the solar spectrum. That is immutable and its laws are the laws of nature.**

"He who every morning plans the transactions of the day, and follows out that plan, carries a thread that will guide him through the labyrinth of the most busy life. The orderly arrangement of his time is like a ray of light which darts itself through all his occupations. But where no plan is laid, where the disposal of time is surrendered merely to the chance of incidents, all things lie huddled together in one chaos, which admits of neither distribution nor review."—Hugo.

Current Thought by William Sibley

This *Is* the Age of Change

WRITING in this department last January I titled my article: "The Age of Change" and catalogued a few of the countless ways in which present day methods are being revolutionized. In that article I pointed out only a small fraction of that which is now being accomplished by engineering and science, but of which we unfortunately are not always aware. If you did not read that article I suggest you dig up your January number and do so now. Nothing is more important to the welfare of your business than complete knowledge of what is going on in your own and extraneous fields.

Business today is more hazardous than ever before known—for two reasons: because of the far-reaching developments arising on every hand, having almost limitless possibilities and influence; and, because of our characteristic reluctance to accept or adopt these new things, methods and ideas. The latter—this refusal to credit, reluctance to accept, adherence to disbelief,—is by far the more important of the two reasons why business is so hazardous.

It is not to be wondered that we find it difficult to accept the startling developments of the chemist, physicist and engineer. Twenty or thirty years ago these things were undreamed. And the human mind has ever been the retarding element in progress. When the 3- and 4-tonged fork was being introduced to aid in eating (during the reign of Good Queen Bess), worthy ecclesiastics declared from the pulpit that it was an "insult to Providence not to touch one's meat with one's fingers." When the first steamboat plowed its sluggish way up the majestic Hudson, many people asserted that it was in violation of the laws of the Deity to "make fire and water work together, when God had put them asunder."

Nor do we need to go back so far in history to find examples of our reluctance to change the even tenor of our ways. Twenty years ago, the automobile, according to thousands of people, would never be more than a "toy for the rich." Five years ago the International Harvester Company almost flatly refused to sell combination harvester-threshers for use in Michigan, Illinois, Indiana or Ohio, it being their firm belief that these machines would not work satisfactorily in that territory. Eight years ago Thomas Edison, the world's foremost inventor, asserted that the radio would never supplant the phonograph as an instrument for the American home. Tens of thousands of people are living today who would refuse to go up in an airplane—clinging to their foolish fears in spite of the fact that airplane accidents during the last three years have been fewer, per passenger, than in any other mode of transportation. Both officials and members of labor unions still adhere to the utterly fallacious belief that labor-saving machines curtail the labor market and throw men out of work—and this in the face of our extreme prosperity, social standard, and wage scales.

Recognizing our inherent reluctance to accept the newer developments which, by the very nature of things must disrupt established habits, it is small wonder that some of the readers of my January article should have thought that I took the liberty of the stage and padded facts to suit my personal fancy.

Our greatest need today is personal and commercial acceptance of changes. This is the Age of Change and unless we recognize that fact—alter our mental structure to conform to the changed physical structure—we must be content with the position of followers.

A Few More Changes

The Westinghouse people have recently developed a photo-electric eye capable of keeping unending watch over a factory to the end of extinguishing

fires. This mechanical eye, placed in a position where it can see an entire room and where it can control a supply of carbon dioxide gas, will discharge its gas supply and smother a fire whenever called upon to do so. Surely this recitation of a fact must mean more to the average paper manufacturer than merely the recount of an interesting engineering feat. Surely, we must be able to see, in the perfection and adoption of such a device, a greatly reduced fire insurance rate, minimized losses and uninterrupted production from fire. The universal adoption of such a Robot, which maintains sleepless and vigilant protection against fire, together with the device which will stop any machine instantly at the cry of "Help", will collectively do more to promote safety and fire reduction than all the propaganda insurance companies could issue in ten years.

Just two or three months ago a group of electrical engineers in Kansas tested out a little device that may completely revolutionize the power industry. At least it will do so if, in practical application this machine produces results approximating those obtained in the recent demonstration. This little machine, no larger than a gallon pail and weighing about 20 pounds, collected electrical energy from the air and converted it into a powerful current of electricity. When they put the device into an automobile (substituting it for the original engine) it supplied power in such a large quantity that it had to be reduced in order to propel the car in safety. When applied to heat and light loads, it was found this device is powerful enough to light and heat a seven room house—using only ordinary atmosphere as the source for its electrical energy. Mr. Perrigo's (the inventor) discovery has been pronounced revolutionary by several of Kansas City's most eminent engineers.

The device invented by a Bridgeport engineer which will peer into the heart of steel and detect minute flaws buried six or eight inches below the surface, reminds us of the practice now becoming prevalent in the lumber and logging industry of employing the X-ray to look into the heart of a tree to predetermine the extent of decay.

It is no news to our industry that the present day method of distributing milk in glass bottles will probably disappear in the next few years. The paper container, which is more sanitary, less costly and easier to handle, will supplant the clumsy glass containers. There is every reason for this change and it is coming just as certainly as tomorrow's sun—to the benefit of our industry and to the loss of the glass industry. Milk is put in bottles at a temperature of from 40 to 45 degrees. With paper containers, this packing temperature may be lowered to 33 degrees, thereby, retarding bacteria growth and making possible a longer period of preservation. Furthermore, paper is, in comparison, a non-conductor of heat. Ordinary glass milk bottles cost from 3½ to 4½ cents each, while the paper container, even when carefully made from spruce fiber and treated with sterilized paraffin, will cost no more than ¾ cents each. And this transition means another relief for the weary housewife and a lighter burden for the 5-o'clock milk distributor.

Putting Radio to Work

It is astonishing to learn in how many ways the principle of radio transmission is being used. The microphone controlled device which will stop a machine instantly at the cry of "Help" has been mentioned. In Chicago there is a garage which is equipped with a microphone controlled door—a door that will open automatically upon the call of a horn. The United States Bureau of Standards has recently perfected a radio signal for use by airports during dense fogs. The receiving apparatus for this device is merely a small dial and an antenna, weighing only a few pounds. As the fog blinded aviator approaches the landing field, this dial receiving apparatus is put into operation—with the result that before the eyes of the operator there appear two white lines, which shrink or expand as he progresses. This guide permits him to land in safety even in the darkest and most dangerous of fogs.

At an eastern airport a way has been discovered to utilize the drone of an airplane motor to switch on flood lights. The sound waves created by an approaching plane pass through a loud speaker (operating reversely), activate a switch controlling a bank of flood lights surrounding the field. A comparatively small town in Illinois has gone a step further than the "sun switch" control of street lights (which automatically turns on and off the street lights with the coming of sunset and sunrise) and has installed microphone-controlled traffic lights at suburban points where light cross-flow traffic must enter or cross a heavily-trafficked highway. The motorist wishing to enter or cross the boulevard merely has to call to the traffic light with his horn and immediately the intersection control light turns green in his favor. At the end of a predetermined number of seconds, this boulevard stop light turns back to the favor of the boulevard traffic. In a large bank located in southern California the vaults are protected by a dual system of radio control and photo-electric cells. Should a burglar enter the bank at night and use a flashlight, this beam will automatically set off a burglar alarm that is controlled by a sensitive photo-electric cell. Or—if the burglar should be aware of this protective device and use no light to disturb the photo-electric cell—the sound of his operations would still register on the sensitive microphone and set off the same alarm. Instantly, upon release of this alarm the bank and vault becomes flooded with light and permanently fixed motion picture cameras are automatically started which will register the image of the burglar

upon a motion picture film for future identification.

A new system has been developed in Chicago by means of which a single operator can simultaneously effect the setting of type on linotype machines in the composing rooms of any number of cities. This automatic typesetting is accomplished by the use of perforated ribbons operating through telegraph instruments and subsequently applied to the linotype keyboards. This foresees the day when the power of the press may be still further centered in the hands of a very few. In Germany there has been developed a combination clock and microphone which will broadcast the ticks of the master clock and thereby control the accuracy of tens of thousands of other official clocks located throughout Europe.

Such a catalogue of developments could be continued to the point of fatigue. The list of things that are making this The Age of Change is almost endless. It is the rapid rise of deep-going developments which makes this period both full of thrilling interest and extreme danger. A few years ago we were startled by the perfection of a camera that would register the path of a bolt of lightning. Today we are in a position to make that lightning. The chimerical ideas of today are the realities of tomorrow. Today's theories are the proved principles of next week. Twenty months ago it cost $75 to telephone from New York to London—and there were about three calls a day. Today the cost has been reduced to $45 and the volume of calls increased to over 100 a day. It is becoming commonplace for men on separate continents to talk with each other. Today it is comparatively a simple matter for a man in San Francisco to talk to someone in Oslo—a distance of 8000 miles or more.

Not all of the new developments are of lasting benefit. Many of the new things will fall as rapidly as they rise. We must expect bad with the good and be discriminating in our acceptance. However, those who do not accept and where possible, adopt new and better ways, (whether it be ideas, methods or equipment) have no more chance of lasting success in business than an icicle has for permanent and peaceful existence in the Realm of Satan.

The Romantic History of Paper Making

Rise of the Art in China and Its Development in Europe and the West

By DARD HUNTER, M. S.

THE Chinese were the inventors of paper, but it is not known exactly when the craft was first practiced,—some historians state emphatically that it was in the year 105 A. D., while other antiquarians contend that the Chinese were forming sheets of paper as early as 123 B. C. It is fortunate for the purpose of this article that it will not be necessary to arrive at any precise conclusion regarding this point. Papermaking was without doubt of Chinese origin; the art traveling west, first to Samarkand about the year 750, thence to Bagdad and Damascus, reaching Morocco about 1100. Within fifty years after the craft was introduced into Morocco it extended into Europe, its inception being in Xativa, Spain; then moving on to France where the first papermaking was done in Hirault in 1189. The art was then taken to Germany, having been introduced in Cologne in 1320 or in Nuremberg by Ulman Stromer in 1390. Papermaking was probably practiced in Italy earlier than in Germany for it is recorded that the craft had been set up in Mortefano as early as 1279, and later in Venice. Paper was fabricated in the John Tate mill in England in 1494, but not in Holland until almost a hundred years later; and two hundred years after the first English mill was established the art of papermaking was taken to the New World by William Rittenhouse.

In one part of the world or another, paper has been made continuously over a period of more than 1800 years, and all through these eighteen centuries the modus operandi of forming sheets of paper in a hand mould has undergone few changes to the present day. Papermaking still goes on in China, Japan, India, Burma, and French Indo-China very much as it was practiced shortly after the time of Christ; and in Europe the methods in use in moulding sheets of paper are not dissimilar to those of the twelfth century, when the art of papermaking was introduced into Spain from Morocco. Like the crafts of the weaver and the potter, the hand fabrication of paper has experienced little change from its inception to the present day.

While there is an increasing demand for fine hand-

made papers, the number of European mills remains the same and these mills are not adding to their equipment. In England, where handmade paper has already been highly regarded, there are only six or seven mills now at work making paper of this kind. Of the 1,034 vats that were in use in Germany in 1848, but three or four remain in daily use, while in France handmade papermaking is all but a lost art. Italy keeps up the traditions with a number of mills, but not with the quality of the handmade paper produced. Nearly all of the European handmade paper mills are carried on separately from those where machines are used, it having been determined that it is not practicable to combine one with the other.

The old mill at Lime Rock, Connecticut which will be converted into a handmade paper mill. (From the etching by Bernhardt Wall)

Except in an experimental way, there has not been any handmade paper produced in America for many years, as with the introduction of the paper machine this mode of fabrication was short lived. A small company has now been formed in this country for the purpose of making genuine handmade paper and after considerable search a suitable location has been found. An old mill was discovered in a remote part of northwestern Connecticut and the buildings are now being remodelled for the purpose. There is sufficient water power for the project and also pure spring water for manufacturing purposes. The property is located in a small out-of-the-way village known as Lime Rock, on the Salmon Fells Kill River. It is hoped that after the mill is in operation that those who are interested in this particular phase of papermaking will visit the deserted village of Lime Rock, Connecticut and see how paper is made by hand in the ancient manner. This will be the only mill on the Western Hemisphere where handmade paper is fabricated and there will be three or four vats in operation. The new company is known as Dard Hunter, Incorporated.

The vital force in business life is the honest desire to serve. Business, it is said, is the science of service. He profits most who serves best. At the very bottom of the wish to render service must be honesty of purpose, and, as I go along through life, I see more and more that honesty in word, thought, and work means success. It spells a life worth living and in business, clean success.—George Eberhard.

The protection of life, health and productive capacity represents an obligation that is both humane and economic.—Willis H. Booth.

Easy Conversion to Metric

By W. F. SCHAPHORST, M. E.

THERE is no question in this writer's mind but that the United States will some day adopt the metric system. The handwriting is on the wall. Every country of any importance in the world has already accepted it—all but the United States and Great Britain. The "transition period" from our present standard to metric will no doubt cause much expense and inconvenience but the sooner we jump in and have it over with the better.

It is not commonly known that the famous James Watt, an English engineer and scientist, originated the decimal system of measurement. I have always considered it of French or German origin myself, but that is not so. Nor is it well known that our present "English system" is of German origin. We therefore have this interesting situation—the English speaking people are clinging to a German invention, which the Germans themselves have dropped, and the balance of the world using an English invention.

The simplest way to remember the relation between all units in the two systems, is the following:

ENGLISH	METRIC
Length—one yard plus 10%	equal one meter
Weight—two pounds plus 10%	equal one Kilogram
Volume—One quart plus 5%	equal one liter

Concentrate on this little table for a few minutes. You add 10 per cent in each case excepting "liquid measure" and there you add 5 per cent.

Accident and amusement have been exceedingly important factors in progress. Whole industries have been founded on accidental discoveries, and the "toys" of men's imaginations have turned into industrial developments of great value.—Business Chemistry.

The Paper Industry 1929 Safety Contest

January Scores

37 Mills End First Month with Perfect Score

PERFECT SCORES

	PARTICIPANT	MILL	LOCATION
Group A	International Paper Co.	Otis	Chisholm, Me.
	Canada P. & P. Corp.	Laurentide	Grand Mere, Que., Can.
	Kimberly-Clark Corp.	Falls	Niagara Falls, N. Y.
	Dill & Collins Co.	Delaware	Philadelphia, Pa.
	Kimberly-Clark Corp.	Niagara	Wisconsin
Group B	Brown Paper Mill Co., Inc.	Monroe	Louisiana
	Rhinelander Paper Co.	Rhinelander	Wisconsin
	Albemarle Paper Mfg. Co.	Richmond	Virginia
	International Paper Co.	Pierrefield	New York
	Container Corp. of America	Coated Board	Chicago, Ill.
Group C	Sorg-Oglesby-Smith Paper Co.	Sorg	Middletown, O.
	Container Corp. of America	Mid-West	Circleville, O.
	Warren Mfg. Co.	Warren	Riegelsville, N. J.
	International Paper Co.	Montague	Turners Falls, Mass.
	Sorg-Oglesby-Smith Paper Co.	Oglesby	Middletown, O.
	American Writing Paper Co.	Riverside	Holyoke, Mass.
	Bryant Paper Co.	Milham	Kalamazoo, Mich.
	Adams Bag Co.	Chagrin Falls	Ohio
	Gardner & Harvey Co.	No. 2	Middletown, O.
	Lowe Paper Co.	Ridgefield	New Jersey
	Marinette & Menominee P. Co.	Menominee	Michigan
	Bird & Son, Inc.	Phillipsdale	Rhode Island
	American Writing P. Co.	Albion	Holyoke, Mass.
	International Paper Co.	Webster	Orono, Me.
	Kimberly-Clark Corp.	Neenah	Wisconsin
	International Paper Co.	Livermore Falls	Maine
	Warren Mfg. Co.	Hughesville	New Jersey
	International Paper Co.	Winnipiseogee	Franklin, N. H.
	Union Bag & Paper Corp.	No. 5	Hudson Falls, N. Y.
	Warren Mfg. Co.	Riegelsville	New Jersey
	Container Corp. of America	Mid-West Div.	Kokomo, Ind.
	American Writing P. Co.	Platner-Porter	Holyoke, Mass.
	Diamond State Fibre Co.	Bridgeport	Pennsylvania
	Lincoln Pulp & Paper Co.	Lincoln	Merritton, Ont., Can.
	Sorg-Oglesby-Smith P. Co.	Middletown	Ohio
	U. S. Gypsum Co.	Gypsum	Ohio
	International P. Co.	Riley	Maine

IMPERFECT SCORES

GROUP A				GROUP B				GROUP C			
		Points				Points				Points	
Key	Rank	Credits	Debits	Key	Rank	Credits	Debits	Key	Rank	Credits	Debits
A- 8	6	523.115		B-37	6	400.515		C-24	28	234.985	
A-14	7	515.845		B- 6	7	397.700		C-45	29	252.415	
A- 9	8	496.315		B-11	8	338.615		C- 6	30	157.270	
A-11	9	488.300		B-13	9	329.545		C- 8	31	154.915	
A-19	10	483.715		B-31	10	322.130		C-32	32	122.570	
A- 6	11	439.945		B-15	11	321.855		C-27	33	118.685	
A-16	12	405.255		B-18	12	304.870		C- 4	34		13.430
A- 3	13	391.300		B-12	13	293.270		C-23	35		30.770
A-29	14	321.055		B- 4	14	280.655		C-48	36		43.915
A-12	15	268.815		B-21	15	277.085		C-47	37		43.200
A-25	16	236.655		B-25	16	239.355		C-15	38		94.615
A-13	17	209.545		B-30	17	225.555		C-50	39		117.400
A- 4	18	209.045		B- 9	18	40.500		C-20	40		168.985
A-15	19	208.885		B-20	19		18.155	C-29	41		189.315
A- 1	20	192.745		B-33	20		27.955	C-36	42		347.900
A-27	21	150.845		B-27	21		29.055	C- 2	43		431.555
A-28	22	107.415		B-32	22		31.870	C-35	44		527.215
A-30	23	66.755		B-26	23		60.085	C- 7	45		555.645
A-10	24		1.830	B-23	24		107.900	C-57	46		630.970
A- 2	25		79.585	B-17	25		144.555	C-58	47		681.145
A-26	26		89.800	B- 3	26		160.655	C-31	48		896.385
A-24	27		124.400	B-28	27		187.470	C- 3	49		911.515
A- 7	28		198.100	B-16	28		337.155	C-11	50		931.330
A-22	29		668.185	B-29	29		466.770	C-30	51		1009.100
				B-36	30		924.830	C- 5	52		1070.830
				B- 7	31		1702.330	C-51	53		1137.015
				B-10	32		1983.685	C-21	54		1205.800
								C-10	55		1609.100
								C-55	56		2352.070
								C-37	57		2789.515

Reports outstanding: B-1, B-2, B-5, B-35 C-39

❖ NASACO LOG ❖

Many Interesting Meetings Planned

The seventh annual Mid-West Safety Conference will be held at the Stevens hotel, Chicago, March 19, 1929. There will be a general session in the morning at which several subjects of common interest to all sections will be discussed. Sectional meetings will be held in the afternoon and there will also be a dinner meeting. A large attendance is predicted with a good representation from pulp and paper mills.

A number of meetings are scheduled for the following three months, for which programs are not as yet available. It is probable the meetings at Detroit, Mich., May 7, 8 and 9, and the one at Manitowoc, Wis., June 5, will have especially interesting programs for the pulp and paper section.

Has it ever occurred to you that a fellow-worker who fails to practice safety methods is your deadliest enemy? The man who denounces the policy of the company, which strives to aid its workmen, is as truly a dangerous character as the men who, while this country was engaged in war, spread propaganda which tended to weaken the morale of the nation . . . . . The best manner in which to defeat those that preach against safety is to exert ourselves to higher safety standards. When asked to listen to something detrimental to the policy of safety, assert in a firm tone your belief in the movement. Shun the man who would rob you of your health, position and loved ones. Cling to the principles of Safety First which are, after all, merely using wisdom and common sense.—Mead Co-operation.

Late Entrants Make Contest Number 123

In addition to the list of entrants in THE PAPER INDUSTRY 1929 Safety Contest, which was published in the February issue, three mills were registered too late to be shown in this list.

A new entrant in Group A is the Spruce Falls Power & Paper Co., Kapuskasing, Ont., Can.; the North Kansas City, Mo., and Oakfield, N. Y., mills of the United States Gypsum Company have been entered in Group C. This makes the total list of the contesting mills number 123.

The Paper Industry 1927 Safety Contest

Accumulative Severity Rates of Mills in Group C, as of January 31, 1929

Participant	Mill	Rate
Kimberly-Clark Corp.	Neenah	0
International Paper Co.	Riley	0
United States Gypsum Co.	Gypsum	0
Gardner & Harvey Co.	No. 3	.14
International Paper Co.	Webster No. 9	.15
Upson Co.	Board	.15
Adams Bag Co.	Chagrin Falls	.16
Gardner & Harvey Co.	No. 2	.27
International Paper Co.	Winnipiseogee	.31
Union Bag & Paper Corp.	No. 5	.33
Gardner & Harvey Co.	No. 1	.41
Bergstrom Paper Co.	Neenah	.45
Kimberly-Clark Corp.	Atlas	.50
Lincoln Pulp & Paper Co.	Lybster	.54
Union Bag & Paper Corp.	Allen	.64
Lincoln Pulp & Paper Co.	Lincoln	.90
Union Bag & Paper Corp.	Fenimore	1.79
Northwest Paper Co.	Brainerd	1.97
Lincoln Pulp & Paper Co.	Sulphite	2.34

Group A—Nekoosa-Edwards Paper Co. Combined Mills .49

Group B—International Paper Co., Niagara Falls .42

Symposium of Views on Research

Expressions of Several Technical Directors in Pulp and Paper Manufacture

As noted by Dr. Charles H. Herty in the address which he delivered before the American Paper and Pulp Association at the annual meeting last month, all of the important and basic industries in the United States have a high sense of the value of fundamental research; several of them maintain laboratories through the joint subscriptions of individual firms. The paper and pulp industry has not yet advanced to the position of supporting a general research institute, though both fundamental and applied research are prosecuted by a number of mills, one large papermaking concern having built a laboratory building for its own use, which compares favorably with institutions of national scope. As to these, readers of THE PAPER INDUSTRY are familiar with the splendid beginning made in Canada under the auspices of the Canadian Pulp and Paper Association and with the work of the Norwegian Pulp and Paper Association, which was described so fully in the report published in the preceding issue of THE PAPER INDUSTRY.

In response to a request, several of the technical directors of pulp and paper plants have favored us with expressions of their views regarding the Norwegian development, and in a paper presented to the Third British Empire Forestry Conference, held in Australia and New Zealand, August to October, 1928, E. P. Cameron, director of the Pulp and Paper Division, Forest Products Laboratories of Canada, has described the development of pulp and paper research in the Dominion, which contains so much of suggestive value as to deserve quotation and we accordingly reproduce herewith some of the main divisions of his contribution.

Pulp and Paper Research in Canada

By E. P. CAMERON

Mr. Cameron first calls attention to the importance and necessity of a system of classification of problems of research, such as might indicate the character of work involved and indicate the personnel and equipment most suited for its accomplishment. We quote from his paper as reprinted in **The World's Paper Trade Review** for February 15, 1929.

Mill Problems—Primarily research problems are developed either from mill operation or from an abstract consideration of possible mill operation, in terms of raw materials, markets, or other economic factors. The genesis of research may, therefore, be said to lie in the mill, and certainly the field of application of the results obtained therefrom lies in the mill; hence is derived a cycle-mill operation, research endeavour, mill operation—which is more or less complete in all cases.

All research problems are, therefore, mill problems, but a vast majority of them can be much more adequately and satisfactorily studied outside of the mill environment, owing to the very nature and necessity of the conditions governing mill operation; others may be said to be true mill problems, in that actual mill operation is the only possible place for their active study and solution. Those problems which can be isolated to advantage from mill operation can be divided quite readily into two fairly well defined types, namely, technical and fundamental. Thus there is an empirical division of all research problems of the industry into three general groups—(1) mill research, (2) technical or semi-commercial research, and (3) fundamental or basic scientific research.

Review of Research Development—In Canada research development has taken place along general lines, and it may be of interest here to give a very brief sketch of this development and the general scheme of organization.

The Canadian Pulp and Paper Association was founded primarily as a trade association in 1913, and throughout its life has always represented a closely-knit and exceptionally harmonious voluntary organization. Apart from trade relations and the various studies related thereto, the association has always been deeply interested in the technical phases of the industry, and it has been through the operations of the Technical Section of the association and its offshoot, the Research Section, that the great strides in technique and research have been accomplished. Composed of from 85 to 90 percent of the operating mills in Canada, the association is a truly representative body, and its voice and actions are those of a well-nigh unified industry.

The Technical Section made a thorough study of the research needs of the industry and finally proposed co-operation with the Division of Pulp and Paper, Forest Products Laboratories of Canada, a federal government institution, as the most feasible and efficient way of developing a research organization suitable for their needs. After successful negotiations with the Government, this proposal was adopted, the co-operative organization coming into being in 1925.

The problems undertaken have been in general basic to the industry as a whole, and the results obtained of some definite utility to its more efficient operation. This is true of the work of the Pulp and Paper Division of the Forest Products Laboratories, both before and after co-operation was effected with the industry. It may be of interest to sketch briefly the nature of some of these investigations and the results obtained.

Chemistry of Wood and Pulp—This project has constituted one of the main fields of effort of the division since its inception. The work is fundamental in the sense that the character and reactions of the various components of wood and pulp are being sought, not only that their analysis may be developed to a definite basis, but also to give some insight into the basic reactions of pulp production. The estimation of cellulose in wood has received a great deal of attention, the culmination of which has been the development of a method based on the use of hypochlorous acid and ammonia. Studies on the constitution of cellulose have been carried out to gain further knowledge of the nature of this exceedingly complex body. The action of chloral on cellulose has been investigated in particular in this relation, with some very interesting results. This type of work represents primarily the fundamental field, and the results accruing from it always have a basic bearing on the operations of the industry.

The Physical Testing of Pulp—Another major field of investigation for the division has been pulp testing. This work is of primary importance in that it represents the development of "methods of measurement" by which the character of pulp may be determined. Without such means of measurement, progress in the industry is greatly handicapped. The work conducted on strength testing has been instrumental in initiating international standardization in this field. Of particular importance in this connection was the work carried out on the effect of pressure on strength, the results of which changed the basis and conception of this important test. The standardization of the freeness test, with its development of a properly standardized instrument, has been of considerable value to the groundwood pulp manufacture. This instrument and the procedure developed for its manipulation have been adopted as official standards by the Canadian Pulp and Paper Association, and about sixty instruments are in use throughout the various mills of the Association. . . . . The microscopic studies undertaken have yielded advances in the technique of fiber analysis and differentiation. A fairly accurate idea can now be formed as to the nature and probable behaviour of a pulp by this method of analysis, and the value of accurate fiber differentiation and estimation in papers, textiles, and other fibrous materials is unquestioned.

The "Alexander Stain" developed at the laboratories has been of considerable value in differentiating bleached and unbleached sulphite pulp. Fiber quality has been investigated by mechanical, chemical, photometric, and electrical means, but up to the present no satisfactory method of determining this rather elusive characteristic has been perfected.

Allusion was made by Mr. Cameron to several specific investigations conducted for the benefit of the Canadian pulp and paper industry, including a determination of the pulping quality of fire-killed wood; a study of the Bache-Wiig process for the pulping of straw; manufacture of blotting paper from sulphite poplar pulp, and other problems. In regard to the trend of future work, fundamental research will be continued and the results established by semi-commercial and papermaking trials. Having substantiated and developed fundamental findings, the semi-commercial results will be further applied to commercial mill operation, and thus complete the investigations undertaken.

The general organization for the work comprises the purely research men, studying the fundamentals of the processes and developing data of basic importance to operation; the semi-commercial investigators, making use of the data furnished by the fundamental workers, further developing them and transforming them into terms of commercial operation; and, finally, these same workers carrying their results to the industry and superintending their application until the industry itself and, through the industry, the country have reaped the benefit of the long endeavour.

Reflections on the Norwegian Report

In view of the action taken by the Technical Association of the Pulp and Paper Industry at this year's meeting to provide the sum of $1,000 for pulp and paper research at the Forest Products Laboratory in Madison, Wis., providing an additional $4,000 will be appropriated by the American Paper and Pulp Association for the same purpose, some of the comments from interested readers of the Norwegian report as published in our February issue will be read with interest.

Research, Aladdin's Lamp Come True

By ALLEN ABRAMS

Technical Director, Marathon Paper Mills Company

You ask my opinion on research and I am going to counter by suggesting that you extract from your young hopeful his conclusions on Santa Claus at about seven o'clock on Christmas morning! Really, don't you agree with me that this thing we call research is just Aladdin's Lamp come true—the most amazing, the most potential and the most inexorable force operating today; ramifying into every activity and making itself felt in every field of human knowledge and human endeavor?

I am astounded when I reflect back the comparatively few years to the "still picture" of my boyhood age. To refresh your memory, those were the days when a home was occupied largely with the rearing of children, gas furnished light, the family grocery food; castor oil was a favorite prescription and legs were used extensively for walking. Cotton clothing was lavishly employed by the pompadoured, trussed and long-skirted women of the day, while the men were resplendent in whiskers, gold teeth and derbies. The family photograph album constituted a sport, second only to the sheer enjoyment of a buggy ride and family picnic.

These things I mention for their historical significance and so that you may contrast them with the motion picture—not a slow one either—of today. Your modern home is a symbol of this changing order—light comes from an incandescent filament surrounded by an inert gas; chain stores have bid the grocer go, refined lubricating oils and alphabetized vitamins are in the medicine chest and nether limbs are used chiefly for golf or display. Dull old cotton has been synthesized into lustrous rayon; movies, talkies, jazz and the radio are popular indoor sports, while the automobile and airplane have accelerated the old buggy to 60 or 150 miles an hour.

These scattering earmarks of our modern world betoken this force of research—a force as powerful and as mysterious as gravity itself; and just as inexorable because the germ has penetrated our blood so completely that it sometimes seems we should call a halt for ten years to breathe a bit, reflect, catch up and enjoy the things we now have on every hand.

But we shall not see this happen in our day. One may have a philosophy which measures the success of life only in contemplation and enjoyment of the simpler things; but today we are in the midst of complexity. Along comes the Big Parade and, whether we will or no, we are going to join it. The only question is—shall we take a seat on the band wagon or shall we carry water for the elephants; and of course the answer is—let the pachyderms go dry!

In one of his celebrated addresses, Arthur D. Little aptly said, "The price of progress is research, which alone assures the security of dividends." There seems to be some truth in the remark when we recollect that a number of years ago the U. S. Chamber of Commerce stated that this country had expended $35,000,000 in research for that year and had saved about $50,000,000 thereby. Newspapers, magazines and the radio broadcast daily so many examples of its value that one shortly becomes tiresome if he lists them over again.

Let us see, however, what has happened to the American pulp and paper industry in the past few decades.

Logically we start first with pulp, and so with wood. No longer do we find the reckless abandon of the lumberman, leaving a trail of waste behind; but today much of this scrap is either chipped and cooked to pulp or blown, by the breakfastfood route, into the finest kind of insulating material. Where we used to have yields of 4 to 45 per cent, now through the work of the Forest Products Laboratory, we are carrying the semi-pulping yields up to 65 to 70 per cent and still getting suitable fiber. We have made great strides in quality so that today one can buy wood pulp fiber which compares favorably with grades of rag pulp. We have seen new varieties of wood pulped successfully; have witnessed the shutting down of sugar cane bagasse boilers to promote the application of underwear to houses; and may see the hogs go hungry if the cornstalk pulp enthusiasts carry out their program.

Paper machines have fallen in with this allegro tempo. Not content with speeds of a few hundred feet they must step up to a quarter mile per minute; and, as if that were not enough, spread out to 25 feet in width. Then came those who felt that Nature abhorred waste even more than a vacuum—so now we are making more, better and cheaper paper on machines so reduced and encased that one is at a loss to find the driers! With these developments—increasing production, improving quality, cutting costs—have gone so many others that it would require a respectable list to set them all down.

Then logically coupled with these changes have been the development and introduction of new grades of paper including a whole range of food packages which have literally revolutionized some food industries; transparent wrappings enhancing the appearance of the product and selling it the while they protect; papers which have aptly gone in for sanitation; mulch paper which bids fair to give the home gardener two tomatoes where but one used to grow; insulating boards which make the home temperature a joy throughout the year.

And so we can look with some satisfaction on what has been done, even though we might wish that the record showed more advances of greater fundamental importance. If we stop to find the reason for this deficiency in such progress we shall get part of the answer in the fact that only about 10 percent of industrial research is of a basic character; and we shall find another part of the answer in the fact that most of our research is done individually rather than collectively.

The nature of the pulp and paper business today is such that we shall always have mills working on problems peculiar to themselves; but the tragedy of waste enters in when we find that many of these organizations are either repeating work which has already been done or is being done simultaneously by another mill. Unquestionably there are certain basic and common problems into the solution of which the industry as a whole should put its funds and its men.

Some time ago the Weekly Business Review of the American Paper and Pulp Association advocated the establishment of a central research laboratory—no doubt having in mind the particularly excellent arrangement in Canada whereby the Canadian Pulp and Paper Association, the Canadian Government and McGill University joined forces to erect, equip and maintain an institution devoted to the study of cellulose and the fruits of whose research will unquestionably be most attractive. While nothing came of the plan, yet it was again up for discussion at the Technical Association of the Pulp and Paper Industry meeting in New York in February, 1927.

At that time there developed, not so much opposition to the central research laboratory, but rather the belief that the industry should get fully behind our own Forest Products Laboratory. Thus they could assist them in securing funds, in working out a research program on fundamental problems, in keeping an advisory committee from the industry at their disposal; and finally to join forces with the laboratory in carrying their researches into successful mill application—without which research is valueless.

That these plans have begun to mature may be seen in the increased appropriation the laboratory now has; in the excellent report of accomplishments and the program of research made public recently by the laboratory; and in the close contact now being maintained with the paper associations and the mills.

Frankly, I do not believe we can be compared with Canada. Ours is a more complex, widespread and diversified pulp and paper industry than theirs. There are more kinds of mills, more varieties of pulp and paper, less centralization. To be sure we are beset with fundamental problems calling for solution. If we would maintain our place in the pulp and paper world, we must really turn aside for a moment, organize and set in motion the forces which will give us these results.

After all, what we need most is greater knowledge of the tools we are now using and the development of new tools. Such information does not come by chance nor does it come in a day. Let the industry supply the funds and the counsel and let us use our own Forest Products Laboratory as a research center until some one can propose a more logical and more effective way of accomplishing our purpose.

Organized Research to Include Printers' Problems

By ERNST MAHLER
Vice President, Kimberly-Clark Corporation

While deeming it impracticable under the present organization of the American Paper and Pulp Association to start a movement for organized research, Mr. Mahler affirms his belief in the value of research work in connection with the operation of every paper and pulp mill. He says:

"Under the highly competitive conditions which face our industry it is essential that the operator devote his entire energy to the making of a perfect product at the lowest possible cost, therefore, a separate organization must be set up for control and development known as a Research Department.

"The operator should have nothing to do but to repeat intelligently, from day to day, the one best method to manufacture a perfect product. To enable him to do this the fundamental principles of the organization must be clearly defined and standardized. Better ways must be found to operate the methods through research because the best known method of today may be antiquated tomorrow, and it is up to the Research Department to find the new way. Research in industry means to know the facts of what there is today and from that map out what will have to be done tomorrow. Research must find new uses for paper and pulp products so to help absorb the additional tonnage of standard papers brought into the market in recent years.

"Before very long organized research of the entire industry will have to be established. It is also essential that sooner or later a close contact be established between the printing industry and the paper industry. The printing industry is constantly providing bigger and faster equipment, making higher demands on the paper manufacturer and new printing processes demand special kinds of paper.

"At present only vague information reaches the paper manufacturers as to problems on which the printing industry is working and the paper manufacturer tries to meet the demand of the printing industry only after a resulting loss of energy and entailing great waste. All of this could be avoided by the proper organized contact."

A Central Research Organization

By B. W. SCRIBNER
United States Bureau of Standards

Captain Melby's report of the Research Committee of the Norwegian Technical Society is further evidence of the value of papermaking research and of the advantage of solving technical papermaking problems of common interest by cooperative effort. The best results are, no doubt, obtained by means of a central research organization such as Captain Melby describes. With the increasing depletion of our raw materials, it is more necessary than ever that intensive research be made to secure fundamental knowledge, still largely lacking, on papermaking materials, on their reactions in the papermaking processes, and on the properties of paper. The adequate development of new products, of new uses for paper, and of new markets in general, is largely dependent on cooperative technical research effort on a scale commensurate with the position the paper industry holds among the great industries of our country.

Diversity of Problems in the U. S.

By JOHN D. RUE
Director of Research, The Champion Fibre Company

It is quite natural that you should have raised the question as to the advisability of a central research laboratory for the United States, especially as the Norwegian report is coincident with the concentration of interest in the new Pulp and Paper Research Laboratory which was opened in Montreal last week. The subject has been agitated for some little time and it is worthy of most careful consideration.

Conditions in the pulp and paper industry in the United States differ markedly from those either in Norway or Canada. In both of those countries the industry is far less diversified than is the case in the United States. It is much easier, therefore, to arouse a common interest on the part of the manufacturers in a central research laboratory. It is further easier to build a research program which will, by reason of its direct approach to problems of the industry as a whole, maintain that interest over the extended period of time necessary to the attainment of valuable results. In the United States there are problems relating to sulphite pulp; those relating to sulphate and soda pulps; those relating to old paper recovery; those relating to strawboard manufacture; those relating to coating, etc., through a wide variety of diversified types of products and processes. The sulphite pulp manufacturer is not vitally interested in aiding in the support of research for the manufacture of strawboard, nor the strawboard manufacturer in research for the coating paper mills, etc., down through the list. It becomes evident that for any central laboratory to secure and hold the interest of the industry as a whole it would be necessary for it to maintain active research on a wide diversity of problems and to use the greatest care to bring financial returns to each of the groups represented in the industry. The development of a central laboratory supported wholly by the industry seems, therefore, to be for the United States a doubtful undertaking.

There is, nevertheless, imperative need that the research should be undertaken. The question then remains—By what agency or agencies? The establishment of a Research Committee representative of the industry will probably be a most essential part in the development of any research program of national scope in the pulp and paper industry. The function of such a committee may be conceived to be, first, to co-ordinate such agencies, either within or outside the in-

dustry, as may be functioning for research purposes; secondly, to rally the support of the industry to an extension of the activities of such of the agencies as may be worthy of support; and thirdly, to foster the development of specialized research in the interest of special groups of the industry.

The work of the Paper Section of the Bureau of Standards on paper problems and the work of The Forest Products Laboratory on pulp problems are well established and already directed to an attack upon problems vital to the industry. A central committee could do much to enlist the active financial support by the various groups of the research on those problems, specifically of interest to the respective groups. With such support the progress made on those problems could be greatly accelerated and with a minimum of cost to the industry.

Specialized applied research for individual groups could be initiated and developed under the guidance of a central committee as the need for such research became evident. The agencies and facilities made use of would of course depend upon conditions peculiar to each individual case.

It would appear, then, in conclusion, that a central research committee would be feasible and is most desirable as a means for coordinating and fostering research that is much needed in the pulp and paper industry, but that a central research laboratory supported by the industry, would not be practicable.

Research Department Not a Cure-All

By EDWIN SUTERMEISTER
Technical Director, S. D. Warren Company

I have read Captain Melby's report on the research studies initiated by the Technical Society of the Norwegian Paper Industry with much interest and considerable surprise. We have always been led to believe that the paper and pulp industry in European countries was far better managed technically than anything on this side of the water and yet from this report I should judge they were just beginning to do the type of work which has been carried out in this country for years. Much of the work which this report outlines has been done by the Forest Products Laboratories in Madison and Montreal, by the Bureau of Standards, the Bureau of Chemistry and by many of the laboratories operated by the various paper making concerns. Of the three classes of industrial research which they list I have been actively engaged in two of them for the last twenty-nine years and I know that the members of all paper-making laboratories are handling such problems daily.

As to research work in general I hardly know what to say. Of course I am in favor of research if it is properly planned and carried out but I am quite sure that many persons in positions of authority consider it a cure-all and believe that all that is necessary is to establish a research department and their troubles will be over and their future assured. Unless the research staff is wisely selected and the work carefully planned by one who is entirely familiar with manufacturing conditions it is likely that useful results will be very greatly delayed.

I have never been very enthusiastic about a central research laboratory for the paper and pulp industry. It seems to me that it has several elements of weakness which will very greatly limit its usefulness. In the first place most concerns are not going to assign to it any problems which they think can be worked out by their own force and to their especial advantage. That means that it will have only general problems and even if these are solved successfully their practical application may not come for years. Another objection is that conditions in different plants seem to be such that many of the results of research cannot be applied at all. Take the results of sizing investigations, for example. Probably as much work has been done on this problem as on most of the others put together yet there is still no agreement of opinion, though each worker probably feels that his conclusions are the last word. The final answer seems to be that slightly varying conditions in different plants make each an individual problem and that after the completion of the general research it is necessary to undertake research in each plant in order to apply the results of the central laboratory. The same conditions obtain in work on sulphite cooking and what will work well in one plant will not be at all satisfactory in another. I have seen so many such cases in connection with entirely different lines of work that I am rather skeptical of the value of a central laboratory.

As you may gather from my remarks, I believe the place for research work is the laboratory connected with the mill which expects to benefit from the results obtained. The work can be better supervised, can be carried out under conditions which give the workers a better insight into manufacturing needs and is much more likely to lead to valuable results. When ably conducted under such circumstances I believe it should be extremely valuable.

International Paper Company Helped to Develop Artificial Grindstone

In a letter received from C. F. Rhodes, manager of the Bureau of Tests of the International Paper Company, at Glens Falls, N. Y., he calls attention to the article published in the February issue of THE PAPER INDUSTRY, describing the opening of the Canadian Pulp and Paper Research Institute in Montreal and quotes from the paragraph on page 1960-b, headed "Industrial Use of Fundamental Research", in which Professor Bancroft is quoted as saying: "There was no demand for a better grindstone, the natural pulpstone being considered better than anything that could possibly be invented, and when the Norton Company worked up what they believed was a better grindstone it was difficult to get anyone to try it."

Mr. Rhodes does not consider this reference by Professor Bancroft fair to the research organizations of the paper industry. He calls attention to the fact that the Research Department of the International Paper Company co-operated in the development of the Norton stone and was instrumental in making it a practical accomplishment. He adds that "as soon as the proposition reached what first appeared to be a commercial possibility, other companies as well as our own installed these pulpstones, and co-operated in their further commercial development."

We are glad to publish the foregoing because we are aware that the statement made by Mr. Rhodes is justified by the facts. Professor Bancroft is widely known and takes a ranking position among the authorities of the world in colloidal chemistry and it is perhaps not to be expected that he has kept closely informed of other developments in the pulp and paper industry.

Opportunities in Forestry for Legion Posts

According to a statement given out by Professor Frank B. Myers, of the New York State College of Forestry, Syracuse University, many American Legion posts in the West are encouraging reforestation and giving instruction in forest tree planting to Scouts, boys' and girls' clubs. He also points out that in West Haven, Conn., a Legion post accounts for its increased membership, the largest in its history, by forestry activities.

Professor Myers believes that the Legion might well undertake a forestry program as a patriotic project and that the Legion should be afforded every encouragement toward such work. In New York State it is understood that any Legion post undertaking reforestation, either upon publicly owned lands or property owned by the post, may secure planting stock from the State Conservation Department without charge.

Honor for E. Morterud

Einar Morterud, of Torderod, near Moss, Norway, has been awarded the Gunnerus medal of the Royal Norwegian Society of Sciences in recognition of his work in the advancement of pulp engineering. Mr. Morterud was on February 26 granted a U. S. Patent on the operation of pulp digesters, which consists of a method for reducing the pressure immediately before blowing the contents.

Mr. Morterud has been visiting mills in the United States and will shortly return to Norway.

A.P. & P.A. Meets for Last Time in Waldorf-Astoria Hotel, New York

Reorganization on New Lines Proposed Under Direction of Manager Yet to Be Selected—Annual Banquet a Merry Affair

THIS year's meeting of the American Paper and Pulp Association marked the last of the meetings to be held in the historic Waldorf-Astoria Hotel, for the building is to be demolished in a few months. As if to celebrate the passing of the famous hostelry which has housed the gatherings of the organized paper manufacturers of the country for upwards of thirty years, the convention was largely attended. All of the associations affiliated with the American Paper and Pulp Association held meetings during the week and these contributed to the crowds that thronged the various assembly rooms and passageways of the hotel.

A number of circumstances combined to make the fifty-second annual convention one of extraordinary interest. A Committee on Development had been at work during the year on a program of reorganization for the association and made its report at the general business meeting, which was also addressed by Dr. Charles H. Herty, who spoke on future possibilities in the utilization of cellulose, and by Judge William E. Humphrey, of the Federal Trade Commission, who addressed the gathering on trade practice conferences.

Report of the Secretary-Treasurer

The meeting was opened by President D. Clarke Everest at 1:30 A. M. on Thursday, February 21, who appointed a Committee on Nominations, after a motion to dispense with the reading of the minutes of the preceding annual meeting had been entertained, and the report of the Secretary-Treasurer was presented. Copies of the annual report of the secretary-treasurer, Major Oliver M. Porter, had been distributed in printed form to all in attendance.

Secretary Porter Pleads for Financial Support—Secretary Porter took the floor to make a statement concerning financial support for the association. In a recent issue of the Weekly Business Review of the association he had asked the question, "What does the paper industry of the United States expect from the American Paper and Pulp Association?" In other words, what return is asked for the $48,959 which the industry is now investing in dues to the association. Major Porter said the association stood high among the organizations representing the great industries of this country, and yet its annual income was less than 1/200th of 1 per cent of the industry's annual sales!

Continuing, the secretary said that the association's membership represented less than 40 per cent of the total number of pulp and paper companies of the United States, and perhaps 75 per cent of the industry's annual tonnage. "And yet", said he, "the paper industry of the United States must have an American Paper and Pulp Association. It must maintain and develop a competent headquarters' staff which can meet the industry's needs for information, protection and leadership."

Hamstringing the Leaders—Speaking of the restriction of effort caused by lack of adequate funds, Major Porter said that the current program of activities does little more than scratch the surface of what should be done by the representative organizations of a great industry. The industry meets annually in a convention. Annually it elects officers to direct the activities of its association—asks extremely busy men to give freely of their time and energy to initiate and carry on activities for the good of the industry as a whole and of each of its related branches—and then, it handicaps and virtually hamstrings those leaders in such efforts by lack of sufficient funds to do essential work which must be done for the industry's protection and progress and which can be done only through a representative national association.

A Great Opportunity Exists—An opportunity will exist, he said, under the administration of Mr. Hoover as President to work with governmental agencies in eliminating uneconomic and unprofitable practices, in effecting a limitation of production to actual demand, and in approximating that measure of profit which their investment and efforts should afford. The question was would the paper industry be in a position to improve these opportunities for helpful service by an adequate financing of its national association. He said that he knew what the American Paper and Pulp Association was capable of doing for the industry with adequate support, both personal and financial.

The General Manager—Referring to the report of the Committee on Development regarding the employment of an experienced general manager for an expanded American Paper and Pulp Association, he said he would welcome such a man as the directive head of the association of which he was the executive secretary, but would say, "God pity him", if he were to be found and installed as general manager of the American Paper and Pulp Association without adequate and even generous financial support from the industry. To succeed, such a man must have the industry solidly organized behind him and must have sufficent funds to operate satisfactorily and in the best interest of the industry as a whole.

Excerpts from the Secretary-Treasurer's Report

The actual report of Secretary Porter was prefaced with a description of the activities of the association during the year 1928, with comments on the condition of the industry and the outlook for 1929.

Although more paper had been produced in 1928 than in any previous year, it had not been a profitable year for the industry, nearly a quarter of the machine capacity of the mills being idle. Notwithstanding this, new production facilities had been added much more rapidly than increased competition warranted. This naturally led to intense competition, with the result that the profits of the industry were seriously affected. There was no prospect of improvement in the situation in the months immediately ahead, which would likely show further increased production facilities and keener competition.

What Profitable Production Depends On—Major Porter suggested as the industry's 1929 motto, "Not less production but greater demand—at a profit" or more briefly, "Quote for a profit". Profitable production depended on legalized price control, which in turn depended on the willingness of the leaders in each branch of the industry to co-operate for their mutual profit and the prosperity of the industry as a whole. Continuing the report said:

Value of the Association to the Industry—There is no question as to the value of the American Paper and Pulp Association to the paper and pulp industry of the United States. The association enables the industry to act as a unit for its own protection, promotion and perpetuation with respect to the major problems of general import to all branches of the industry.

With fundamental problems common to so many mills in each of the various grades in the industry, it is absolutely essential that there be a well-organized, adequately financed and ably-led association to speak for the industry as a whole and to work continuously for its advancement by putting

the industry squarely back of broad comprehensive movements on which its progress must be based. The industry is fortunate in having in the American Paper and Pulp Association just such an organization, which is recognized both here and abroad as representing the paper manufacturers and converters in all their major common problems.

The paper industry stands seventh among the great industries of the nation. It is a fundamental basic industry, with an annual production in excess of 10,000,000 tons, valued roughly at $1,000,000,000. One cannot picture our modern civilization and commercial progress without the products of this tremendous industry. To meet these needs it must progress, it must operate at a profit and it must be a permanent industry. These objectives are those for which the American Paper and Pulp Association is working, and it is for these reasons that the Association merits the industry's substantial financial support and the ready co-operation of its executive leadership.

Fundamentals—It might not be out of place here to record some of the fundamentals, as recognized by the association's Committee on Development, which may govern the character and extent of the Association's service to the industry and its relation with other organizations in the industry.

(a) The American Paper and Pulp Association is a federated organization, representing the entire paper industry in all matters of general interest and fundamental importance.

(b) The association's function is to handle the industry's major common problems and to coordinate, as far as possible, those services or activities which affect all mills in every branch of the industry.

(c) It is logical and necessary that groups of manufacturers making similar products, and thus having similar problems, should form associations to take care of those problems, but these associations should be affiliated with the American Paper and Pulp Association in order that it may effectively represent the interests of the entire industry. This affiliation should be on the basis of a nominal affiliation fee unless it is consummated on the basis of special statistical or other services to the affiliated association, in which case the affiliation fee should be commensurate with the extent, character and cost of this special service.

(d) The association will make a continuous effort to form constituent groups and to bring them into affiliation with it. The secretary of the American Paper and Pulp Association or other members of its staff may have occasion to act temporarily as secretary of the groups being formed into associations during their development stage.

(e) Membership in the American Paper and Pulp Association should be confined to manufacturers and converters of paper and pulp or the products thereof, except as divisions may be formed to bring such groups as the supply and equipment manufacturers or associations of other allied lines into the industry's organization structure.

(f) The association should be financed directly by its individual mills on a uniform basis of gross sales. Its financing should be so arranged that special requests for funds will be eliminated in so far as possible.

(g) It would probably promote the effectiveness of organized effort in the industry if all the organizations established for the purpose of rendering service to the entire industry, regardless of grades or product, were to be under the direction of the American Paper and Pulp Association, thus effecting more complete co-ordination of the co-operative efforts of the industry.

Policy—Having been the assistant secretary of the association for eight years it was relatively easy to assume the responsibilties of management without the necessity for any fundamental change in policy.

Our policy has been to focus the association's efforts on those fields which lie clearly within its province and in which there was evident opportunity for useful service to the entire paper and pulp industry of the United States. Emphasis, therefore, has been placed on the association's tariff and legislative work, its statistical, wood-lands and waste utilization service, and on its direct service to its member mills.

One other policy has governed our activities this fiscal year—namely, to keep the association's expenditures well within not only the budget adopted at the last annual meeting, but also within the association's income. This has been done and our surplus has been increased somewhat, so that there is now every prospect of completing the association's current fiscal year with an income in excess of our expenditures and a nominal reserve on which we can draw in case of emergency.

Your secretary wishes to acknowledge the substantial financial support received during the past months from the association's Supply and Equipment Section. This section is composed of some sixty manufacturers of machinery, equipment and supplies used in the industry. The section resulted from the affiliation of the former Supply and Equipment Association, which was organized for the specific purpose of assisting the American Paper and Pulp Association in its service to the paper industry of the United States, on the theory that whatever success the association had in promoting the welfare of the paper industry would be reflected advantageously on the manufacturers of supplies and equipment sold to the industry.

A pamphlet, listing the members of the association's Supply and Equipment Section and their products as available to the paper industry, has been prepared for distribution during this convention and it is recommended that members of the American Paper and Pulp Association avail themselves of these useful data.

Program—Inasmuch as the secretary's annual report is an historical record of the association's activities and accomplishments, I should like to record here the actual program on which we have focused our efforts during the past months, as follows:

(a) Organizing the paper industry for tariff protection.
(b) Furthering the industry's legislative interest.
(c) Promoting waste utilization and stream improvement.
(d) Developing a dependable and comprehensive statistical service.
(e) Continuing effort to perpetuate the industry's wood supply.
(f) Providing effective, direct service to member mills.

After this review of the association's program it seems advisable to indicate what its definite accomplishments have been since the last annual meeting. Described very briefly, these are as follows:

Tariff—Through the association's general tariff committee and in the closest possible cooperation with the Import Committee of the American Paper Industry, the industry has been thoroughly organized for tariff action in the interests of the industry as a whole. Changes clarifying the phraseology in the administrative sections of the tariff law and briefs as prepared by the several associations in the industry were presented through the association's tariff committee brief, to the Ways and Means Committee of the House at hearings on February 13 and 14, 1929, and will be presented to the Senate Finance Committee, in an effort to insure adequate protection for the industry in the pending tariff revision.

Your secretary wishes to express his appreciation of the great assistance and unusually effective co-operation of the Import Committee through its manager, Warren B. Bullock, and its Counsel, Messrs. Whitney and Parker, in the association's tariff activities during the past four months. Our industry is indeed fortunate in having both a strong, well-recognized national association to present its united front in matters of common interest to the industry, and an effective committee to enforce the provisions of the tariff law and thus insure the industry that measure of protection to which it is entitled under existing laws. The Import Committee is doing splendid work for the paper industry in preventing the importation of misclassified and under-valued papers. While the association's efforts to secure adequate protection for the industry in the rates and wording of the various tariff schedules occurs but once in 4 to 8 years, when any tariff law is undergoing revision, yet the work of the Import Committee to secure the enforcement of the legislation thus secured by the Association is continuous day in and day out, year after year. It merits the whole-hearted and adequate financial support of the entire paper industry.

Statistics—The association's statistical service has been

materially strengthened and expanded. Its Monthly Statistical Summary, as now furnished reporting mills, is in comprehensive, printed form, and its facilities for developing special statistical reports are being used by an increasing number of groups in the industry. J. A. C. Kavanagh, the association's statistician, deserves special commendation for the way in which he has carried forward the work of the statistical department.

Waste Utilization—Through C. M. Baker, the association's engineer, the industry has been very well organized for work on waste utilization and stream improvement. Mr. Baker is preparing a series of pamphlets describing the exact methods by which waste utilization may be obtained in the various branches of the industry and the legislative problems involved, etc. His work demonstrates very clearly the value of cooperative effort along these lines and indicates the possibility of very profitable savings to the paper industry through waste utilization and stream improvement. It seems unfortunate that there has not been more general appreciation and hence more adequate financial support of his work by the industry.

Woodlands Section Service—The association's Woodlands Section has been reorganized by its forester, Charles W. Boyce, and a definite program has been undertaken to determine the economic practicability of forestry as a means of supplying permanently the pulpwood requirements of the industry. Although of an extensive nature, this study promises to develop much information which will be of immediate value in the formulation of forest management policies. In this connection a survey the progress of forestry in the paper industry has recently been completed, which reveals the extent to which the industry is providing for its pulpwood supplies.

Foreign Contacts—As a result of efforts by the association's former president and secretary, Norman W. Wilson and Dr. Hugh P. Baker, followed by the activities of the present officers of the association, M. H. Lund has been appointed by the Department of Commerce as Commercial Attaché at Oslo, with the understanding that a large proportion of his time will be devoted to the interests of the paper industry, thus giving the industry in effect a paper trade commissioner in Europe.

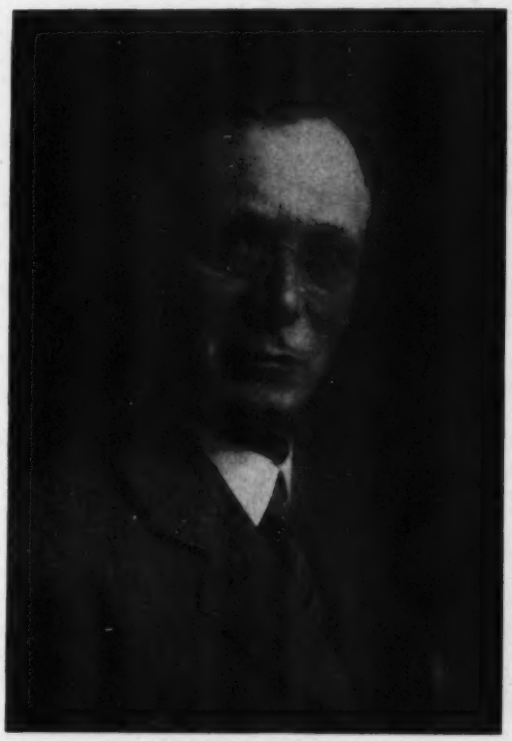
Weekly Business Review—The association has continued its Weekly Business Review, the character of which has been changed somewhat so as to deal more intimately with conditions in the pulp and paper industry, thereby making it of more value to the executives in the industry. Its lead articles take the place of frequent letters and yet enable your secretary to bring to the attention of the executives of the industry matters which he feels should have their timely consideration.

By-Laws and Basis of Dues—At this meeting action will be taken on revision of the association's by-laws as well as on a proposed method of financing the association through annual dues on the basis of gross sales, which, if accepted, will give the association a modern practical working basis which will be both equitable and adequate.

New Affiliations—The structural organization of the association has been strengthened during the year by the amalgamation of the Supply and Equipment Association as a section of the association and by the affiliation of the Wallpaper Manufacturers Association, thus enabling us to extend our services to those branches of the industry.

New Associations—During the past few months persistent effort has been made, under the sponsorship of the association's officers, to bring about a reorganization in the wrapping paper industry. This has been accomplished and the two new wrapping associations—the National Kraft Paper Manufacturers Association and the National Sulphite Paper Manufacturers Association—are now functioning, with their statistics handled by this Association.

Progress has also been made during this period towards a reorganization of the glassine and book paper industries. There is also every prospect for the development of an organization of paper twine spinners—all of which indicates that the association is meeting its obligations to further develop the structural organization of the industry.



Sidney L. Willson
President, American Paper & Pulp Association

Committees—As reports on the activities of the association's various standing and special committees will be presented at this annual meeting, I will simply refer briefly to the service which the men on these committees have rendered to the paper industry. Unfortunately there is an incommensurate appreciation of the work which the association's officers and committee members do for the industry. An association must work through its members and will be successful only to the extent in which its members are interested and participate in its work. Too much of the industry's association burden falls on the shoulders of those executives who are willing to assume those burdens for the advancement and welfare of the entire industry.

Recommendations—After almost nine years with the association your secretary feels that he may be sufficiently familiar with the fundamental problems of the industry to justify the following recommendations:

(a) That the industry effect a unification of financial control of its co-operative activities thus reducing the number of special appeals for funds and assuring their allocation in accord with the importance of the various problems involved.

(b) That the association develop an effective Publicity Service, under the direction of an experienced newspaper man, of:

1—Giving the industry the right kind of publicity.

2—Keeping the members fully informed of its activities.

3—Maintaining close contact with government Bureaus and Departments.

(c) That a market survey of the country's present and potential demand for paper be undertaken in co-operation with the Bureau of Domestic Commerce of the United States Department of Commerce, and the National Paper Trade Association, so as to give a factual basis for the industry's future production schedules.

(d) That the association appoint a committee to work with federal authorities in effort to devise a means for eliminating uneconomic, unprofitable and unfair selling policies and practices.

(e) That the financing of the association's work in waste utilization and stream improvement be through the budget of the American Paper and Pulp Association, as presented for adoption at this meeting, and that the Cost Association be affiliated or absorbed as a section of the association, in order

thus to enable the association to give more effective cost and financial service to the industry as a whole.

(f) That as rapidly as the association's development and financial ability may warrant, it handle the following activities in the interests of the industry's protection, promotion and perpetuation:

1—The development of profitable merchandising and distribution policies for the industry.
2—Trade extension, both domestic and foreign.
3—The development of new uses.
4—National advertising.
5—Economic studies covering perpetuation of the industry's raw material supplies.
6—Further development of centralized research and technical control.

Tribute—Now, at the end of my first year as secretary and treasurer of the American Paper and Pulp Association, I wish to express my gratitude to President Everest, to the members of the association's Executive Committee, to many executives in the industry, to the secretaries of the association's affiliated organizations, to the members of the association's staff, and also to the representatives of the trade press, for the help which has been given me in carrying on the association's work during the months since its last annual meeting. The industry owes much to these men who have given so freely of their time and energy to guide and promote the work of the association.

I am looking forward with pleasure to the opportunity and responsibilities of more effective service to the industry during the coming year through the association's increased facilities for such service.

Education and Training of Workers

The next business taken up was committee reports and J. Norman Spawn, chairman of the Joint Committee on Vocational Education of the Pulp and Paper Industry, reported.

This report had been distributed in printed form and Mr. Spawn read largely from his original report as presented to the Technical Association of the Pulp and Paper Industry at a meeting held earlier in the week, besides adding appropriate comment as, for instance, when he told those present that the paper industry was losing a good bet in not taking advantage of the Smith-Hughes Act (Vocational education law). Other industries were conducting educational work in this way in co-operation with the government and benefiting from it, while paper industry was not displaying the proper interest in industrial education. The responsibility of mill executives for advancing the education and training of workers was obvious in view of the objective of an educational program which should be the production of a greater quantity of a product of a better quality at a lower cost. In this the workers had a large responsibility which they had seldom recognized, despite the possibilities of increased earning capacity.

Federal Board Wants Display of Interest—Mr. Spawn's report showed that the committee had taken up with the Federal Board of Vocational Education the possibilities of training workers in the paper industry and the board had intimated that while it was interested in conducting co-operative programs in all legitimate fields, it must be assured of sufficient evidence of interest on the part of executives and superintendents.

As the result of a questionnaire to mills sent out by the Joint Educational Committee of the Pulp and Paper Industry, it was learned that forty-five mills were carrying on some type of educational activity. Nine mills reported foremanship classes, seven of which were conducted on company time. In six mills attendance is voluntary, but in three it is compulsory.

Thirty-eight mills employed students during the summer. From fourteen mills in this group the information was obtained that 160 high-school students were employed, 60 per cent of which were expected to become paper mill employees.

Inefficient Help a Cause of Waste—It was evident to the committee that much waste in the industry was a consequence of inefficient help. "Experience shows that educational work tends to reduce this waste—the economic significance of which is not generally recognized by mill executives. The conduct of educational programs is handicapped by lack of suitable teaching material, knowledge of teaching procedure, and by the fact that mill management departments are unfamiliar with procedure and have, usually, no one capable of assuming the responsibility. There is, in addition, a lack of definite objectives on the part of the three organizations of the industry which are participating in this work. Only the larger mills are able to employ educational directors and conduct the work with the most profit.

Objectives of Educational Work—"The objectives of educational work include proving definitely its value as a waste prevention measure, in order that the interest of executives may be enlisted in specific programs. The mills must be assisted in undertaking educational work, and every effort should be made to obtain suitable teaching material and to develop adequate teaching methods. The three organizations represented by this committee, should develop a strong co-operative program, co-ordinate the educational work of all agencies in the industry, promote programs in papermaking states, interest state educational departments and secure federal aid under the Smith-Hughes Act."

Sources of Education and Training—Mr. Spawn brought his report to a close by naming the following committees, schools and institutions which he said were available to assist in educational extension work:

Joint Educational Committee of the Pulp and Paper Industry
Joint Text Book Committee.
Education Committees of the various organizations.
Federal Board of Vocational Education.
State Industrial Commissions.
National Safety Council.
National Industrial Conference Board.
U. S. Chamber of Commerce.
University of Maine.
N. Y. State College of Forestry.
University of Wisconsin.
Forest Products Laboratory.
Institute of Industrial Arts.
Three Rivers Technical and Papermaking School.
Massachusetts Institute of Technology.

After the passage of a resolution advocating support and extension of the Vocational Education Committee's work, President Everest delivered his annual address.

President's Address

The address opened with a note on the increasing interest displayed by the industry in association work, an interest which he said was evidenced by the attendance at the general meeting and at group meetings during the week. He referred to the return of the association to the original plan of holding the general business meeting on Thursday. This gave opportunity, he said, for the discussion of subjects that might be brought out in any of the affiliated organization meetings during the week.

President Everest said that the service of the association during the past year had been improved and extended. The endeavor had been made to confine the efforts of the association to things for which there has been a demand; some activities had been eliminated and new ones added.

Commendation for Work Performed—After expressions of acknowledgments to the Executive Committee, special committees and the officers and staff of the association for able support during the year, he touched on some of the specific work of the sections and affiliated associations. In this way, commendation was given to J. A. C. Kavanagh, the association's statistician, to Charles W. Boyce for his work as the secretary of the Woodlands Section and to C. M. Baker for the excellent results that had followed his efforts in waste utilization and stream purification. The various associations of the industry, such as the Cost Association, Technical Association, Superintendents' Association and Salesmen's Association came in for approving mention. The Salesmen's Association was given credit for contributing to the stabiliation of business during the year. The interchange of information respecting market conditions had been helpful in allaying rumors and detrimental influences in the distributing end of the business. He expressed appreciation of the support given to the American Paper and Pulp Association by the

periodical journals of the industry. This report had been invaluable, he said, in getting ideas before the members.

Tariff Matters—Tariff matters received consideration in the president's address. In tariff hearings the value of the Import Committee of the Paper Industry had been demonstrated. After four years of work in which it had handled nearly four thousand cases, the Import Committee had developed a world of information relative to the ways in which the present tariff law pertaining to paper and paper products was being evaded. With this information and the help of the Import Committee, the association was able to present what was considered the best brief submitted in behalf of any industry during the six weeks appearance before the Ways and Means Committee.

Revision of Paper Schedule—In reference to tariff revision and the paper schedules, President Everest said:

"In dealing with this subject, we found that the present tariff law covered seventy-four major items made up of innumerable grades. With respect to fifty-two of these items, no change in rate was asked. We asked for changes in rates in twenty-one items where conditions in the industry have indicated that the existing rates are no longer adequate. These instances are due almost entirely to the development of new types of paper, many of which were unknown in 1922, the time of the last revision of the tariff. Due to the work of the Import Committee, Major Bullock was able to suggest to our Tariff Committee many places in the existing law which needed clarification. In submitting our brief, we suggested to the Ways and Means Committee, a better wording of various sections of the law, which would clarify the situation. If these suggestions meet with approval, I am sure that it will improve the situation for the industry.

Major Oliver M. Porter
Executive Secretary, American Paper & Pulp Association

The Canadian Reciprocity Treaty—"The fact that we were not asking for a duty on newsprint paper brought about a line of questioning as to why we had not requested protection. Our answer to this question was that we did not believe that it would be advisable to ask for a duty on newsprint, as the removal of duty under the so-called reciprocity act twenty years ago had brought about a change in the entire industry. The major portion of newsprint tonnage has been transferred to Canada and it would be foolish for any one to suppose that any rate of protection, which is subject to revision or removal by Congress, would re-establish the business in this country. With the wonderful development of the newsprint industry in Canada, with all its natural economic advantage for the production of that grade, and the fact that the actual consumers are the owners or part owners of several of these properties, it would be preposterous for anyone to think that the United States might again re-establish the newsprint industry and provide its own requirements. There was no fear of the newspapers, or what they might have to say regarding our position on tariff matters. We recognize when we are up against a stone wall. We realize that we were caught in a jam in the so-called Reciprocity treaty and that this industry has suffered from the readjustment due to the removal of the tariff on newsprint and the gradual transfer of the business to Canada.

The Start of Our Troubles—"The removal of duty on newsprint was responsible for most of the troubles of our industry today. Following the reciprocity treaty there was a great readjustment of grades, old mills making newsprint went on to wrapping, book, writing and other papers. During the war, due to excessive demand, there was a breathing spell and this excess production was not badly felt, but with the cessation of the war it was found that these grades were overproduced. It has been a constant shifting of grades ever since the war. One after another, newsprint mills have gone on to other grades and there are yet more to follow. We are not through with this mess. It will take another five years to complete the revamping of the industry. This means that after twenty-five years we will be still wrestling with the problem of readjustment of the industry owing to the removal of duty on one of our largest tonnage grades. That is water over the dam, with some reserve yet to go, but it clearly demonstrates the necessity of adequate protection on the balance of grades made in this country.

"The work of the Tariff Committee has only just begun. I sincerely urge that you give this committee every possible support, both moral and financial, whenever you are called upon, as without adequate tariff protection we will not be able to maintain the industry, together with the half million or more persons who are dependent upon it."

Steps Toward Reorganization—President Everest then spoke of the work of the Committee on Development, a committee which was charged with the duty of recommending a form of organization that would meet the needs of the present-day development of the industry. He said that the committee had done on excellent piece of work but recommended that the matter be referred to the incoming administration with power to act. He thought it would be possible to find a man capable of acting as manager of the association as was recommended in the report of the committee but this might take some time. Meantime he reminded the membership that they had a good association "as is" and he urged continued and more liberal support of it. Continuing, he said:

Need of an Association—"This industry needs an association. It needs the complete organization of the industry in group associations. There is no longer need for sectional organizations. We are in one market and what affects one part of the country reacts on the others. Unorganized groups are not only a bad thing for members of that group, but are a menace to the entire industry. I believe it will be admitted that the better the organization of each group, the better the business in that group. Selfishness is the controlling factor in this business and until some people learn that the rights of others are to be considered and that no business can long exist which thrives on unfair practices in relation to its competitors, we will undoubtedly have a bad condition in the industry. Fear that they may not have continuity of operation, has caused most of the mills to take on desirable orders as "back log tonnage" at low prices. This practice has continued until I believe more than 50 per cent of the tonnage is "back log" and such business which would otherwise be very desirable is without profit, leaving only the smaller tonnage orders on which one may hope to make a profit.

The Bolton
BANDLESS *Plug*
A great step forward in Jordan engineering

Look at the construction! Lock-slotted knives shaped in such a way that the greater the wear the tighter the fit, with *inverted* wedge woods—both knives and wedges driven in endwise—strain on knives and plug body equally distributed over every square inch of surface, no strain on wedge woods whatever and they can't work loose. Plug body is of cast steel with machined dovetail slots.

Compare it with the old style multi-ring plug—knives upon stilts, weakly supported at a few points. Wedges larger at the top than at the bottom, nothing to prevent loosening. Breakage, frequent shut-downs and heavy repair expense inevitable.

But don't take our word for it. Don't even trust the evidence of your own eyes. Judge by performance!

The Bolton BANDLESS Plug has met the test of service—the hardest kind of service in chip board and coarse waste paper mills. Where old style, ring type plugs run 4 to 6 weeks Bolton Bandless Plugs have run 12 months without a stop. Many mills that have had to use solid cast manganese plugs are replacing with Bolton Bandless Plugs to get a big saving in maintenance and power.

Read what one user says

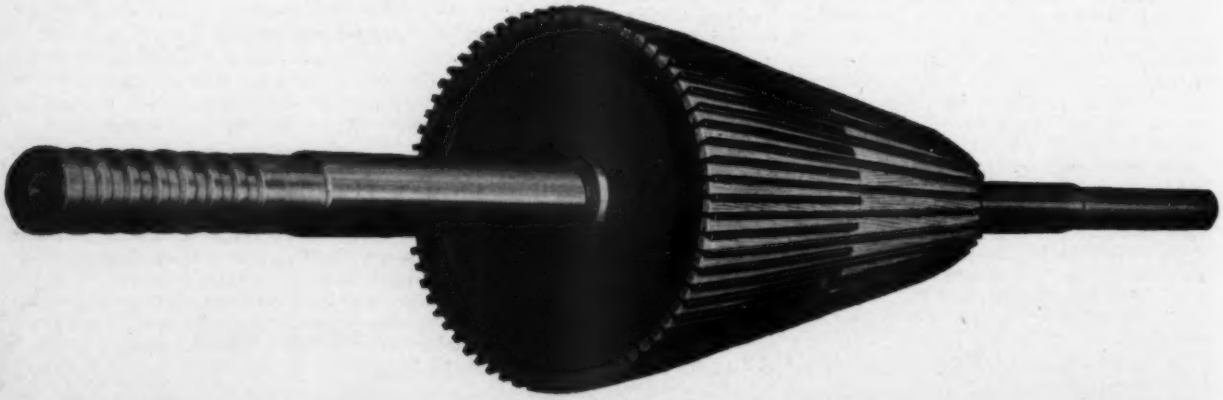
The superintendent of a container board mill using *hot water* put in six Bolton Bandless Plugs after a thorough trial of one under the severest conditions. He says: "We had only been running a Jordan Filling from two to six weeks. We never wore them out but tore them out. We are running these Bandless Plugs continuously and are securing from four to six months wear out of each Jordan without any trouble. We find that our Jordan repairs have been reduced from 100% to 33%.

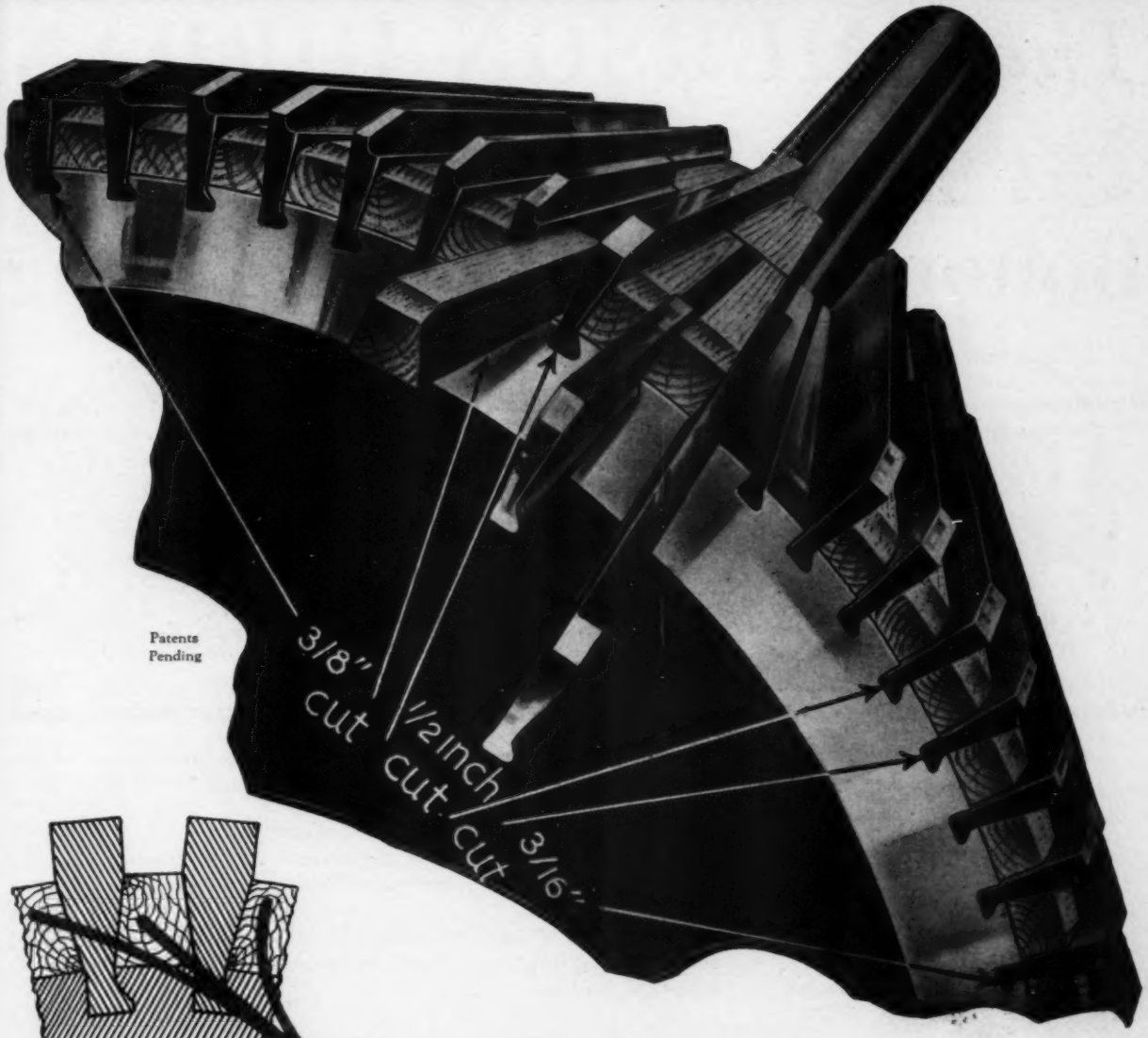
"As far as the filling is concerned, it is much easier to fill a Bandless Plug than it is the old Ring Type. There is no hammering with a sledge hammer to get the filling in and the wood can be driven in with a two pound machinist's hammer. The construction of the bars is such that there is no spring, eliminating entirely the tremendous vibration of the old style Plugs.

"We put about twenty-five tons of stock per day through each Jordan and are pulling about 175 H.P. on each motor so the bars certainly must be of a very high quality and construction to stand this tremendous pressure.

"It has also increased our production as we always have the Jordans in service and are not losing time pulling them out to fill them while the mill is in operation, causing us to slow down for Jordan capacity."

JOHN W. BOLTON & SONS, INC.
LAWRENCE, - - - MASSACHUSETTS

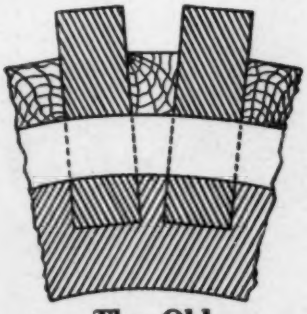




Patents Pending

The New

Wedge woods larger at bottom than at top. Woods or knives cannot come out.



The Old

Wood wedges larger at top than at bottom, nothing to prevent working loose. Knives supported at only a few points.

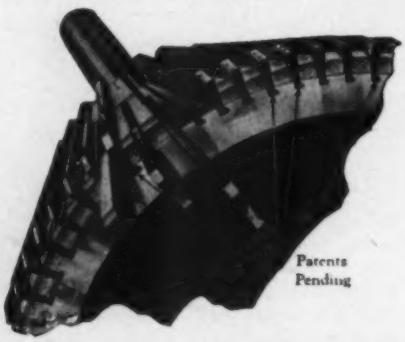
Ten great advantages you cannot afford to be without

1. **Inverted woods—positively cannot come out.**
2. **Reduces maintenance and renewals.**
3. **Absolute rigidity—eliminates vibration.**
4. **An easy one man job to install and replace.**
5. **Greater utility—one plug takes any size knife.**
6. **You never have to buy another plug.**
7. **Increases production with tremendously longer life.**
8. **Provides perfect control and uniform quality.**
9. **Universal application—any size, any Jordan.**
10. **Quickly pays for itself out of savings.**

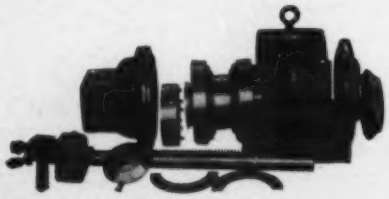
Try the Bolton Bandless Plug! Get in touch with us at once for full information and prices.

2683

The EMERSON JORDAN *equipped with the* Bolton **BANDLESS** Plug



Showing construction of the Bolton Bandless Plug. Knives and woods cannot come out. *NOTE INVERTED WEDGES*



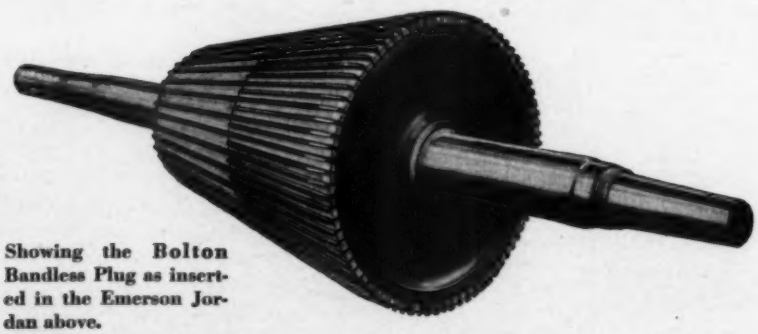
Detail of Timken end bearing which takes care of both radial and thrust.

Now every Emerson Jordan offers you the tremendous advantages of the Bolton BANDLESS Plug and Timken Roller Bearings.

These two great features put the Emerson Jordan in a class by itself for unit control, lasting satisfaction and true economy. No other Jordan has these great construction advantages.

Make sure of all the benefits and savings that result from these two wonderful improvements in Jordan engineering. Standardize on Emerson Jordans.

Write for full information and estimates



Showing the Bolton Bandless Plug as inserted in the Emerson Jordan above.

The EMERSON MANUFACTURING COMPANY

LAWRENCE ∞ ∞ ∞ MASSACHUSETTS

DIVISION OF JOHN W. BOLTON & SONS, Inc.

2683

"We have increased capacity to a point where we have a five-day volume which has been sold on a seven-day operating basis. Old 'General Overhead', the bugaboo of industry, has us on the run.

"We need every branch of this industry organized. This is essential if we are ever to get anywhere and particularly those branches which represent large tonnage and in which there is such terrific competition. We need to operate this business on reliable statistics and not on hopes. As I endeavored to point out last year, we need more complete organization of the industry and more knowledge of what is going on in the industry.

Calls a Halt on Expansion—"We need a breathing spell in building and expansion programs. We have a billion dollars in this business, operating at 80 per cent of capacity and there is no need of further expansion. If there were no additions in equipment during the next six years, the normal increase in consumption would only then have caught up with capacity. We have the most necessary product of commerce and yet, through our own mishandling, we are not receiving the benefits we should from our efforts.

"I believe that 1929 will show an increase in consumption over the previous year. This was true in 1928, but the paper industry did not receive its share of the reward which should have followed such an increase. I believe our situation is critical and we need association effort. I strongly urge that you support the new administration in their efforts to organize the industry. Help them morally and financially. I trust the new administration will receive your hearty support in every way. Don't let us slacken our efforts in any way in anticipation of a new form of association."

Approval for Federal Trade Commission—In bringing his address to a close, President Everest called attention to the operations of the Federal Trade Commission in regard to trade practice conferences and approved the idea as one that was helpful to industry. The elimination of trade abuses and of unfair practices would bring about a better situation. He said it would pay organized groups to investigate this matter and that unorganized groups should organize and confer with the Federal Trade Commission relative to the problems of their branch of the industry with a view to adopting standard trade practices. Judge Humphrey, of the Federal Trade Commission, was to address the association on the subject in the afternoon and he urged all to attend and hear him.

Forget Old Grievances—Finally, President Everest urged all to have faith in one another and forget past history so as to meet the situation on the basis of what is to be done from now on. The trouble with the paper industry, he said, is that we have had too much tradition and past history. There were too many people who remembered some grievance of long ago and who delighted to recount all the troubles of the past, refusing to recognize the necessity of doing something constructive for the future. He was sure that the country was entering one of the most prosperous eras in its history and from developments that have been going on he was convinced that there would be an improvement in the paper business in 1929.

Report Committee on Development

Following the president's address, Colonel B. A. Franklin reported as chairman of the Committee on Development, submitting a comprehensive survey of organization in the paper industry and of the relations of various groups or independent associations to the main association and to each other. He exhibited a chart showing what he termed the circular, the horizontal and the vertical relationship. The circular groups surrounding the keystone or main association included groups like wallpaper manufacturers, writing, cover, and tissue manufacturers, glazed and fancy papers, waxed and gummed papers, etc., while the horizontal groups were represented by Tappi, the Cost Association, salesmen's and superintendents' associations, Import Committee and Waste Utilization Committee. The horizontal membership would include committees and groups guided and financed from the general association, such as legislation, tariff consideration, general statistics, vocational education, foreign trade, etc.

Position of the Papermaker—The report began with a statement setting forth the unique place of the papermaker in modern civilization. With a product amounting to 10,000,000 tons with a value of more than $1,000,000,000, the paper manufacturer has gathered around him a group of highly trained workers, well paid and apparently satisfied. He is essentially a great and growing fixture in the scheme of America's great development of industry and commerce, but he is faced with two difficulties—overproduction and competition. Organization is therefore necessary. As a single manufacturer he is subject to the ills and fears of competition without obtaining the best values of competition, because he is without the fundamental facts of the business as a whole; the comparative relation of demand and supply of the whole, production, shipments and state of the market.

Handicaps of the Lone Manufacturer—Colonel Franklin instanced several handicaps of the single manufacturer who, he said, "becomes a decentralized unit of a progressing industry, advancing possibly to his own satisfaction, here and there, but certainly without the complete knowledge, aid, and assistance of group organization, which have always proved valuable and profit making." Co-operative competi-

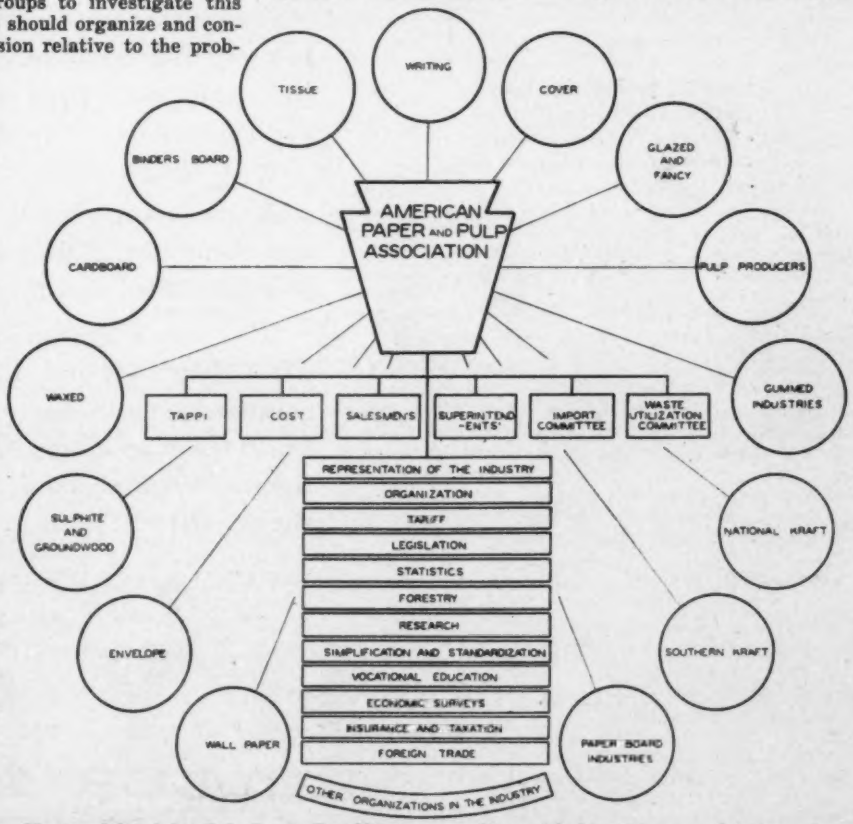
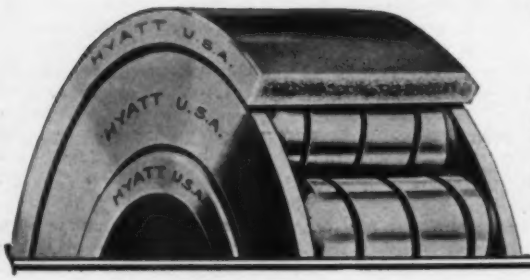


Chart exhibited by Col. B. A. Franklin in connection with his report as chairman of the Committee on Development



POOR bearings bring more repair ills, perhaps, than any other single cause. Bearings that stick, drag and quickly wear, are a continuous source of trouble.

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tion and not cut-throat and ignorant competition was the basis of the best industrial success. This, he said, had been afforded abundantly by trade associations.

Needs of a Satisfactory Organization—Passing from an account of organization and development of trade associations in the paper industry, the report mentioned some of the particular needs of a satisfactory organization of a central character. It was a commonplace to say that some general organization should be charged constantly with the responsibility of organizing grade groups. Lack of a sufficiently strong central association in organization and finances had not permitted this accomplishment. The relations of various groups, associations and committees were then sketched as outlined above.

The basic principles and proposed organization were then stated, as follows.

"Basic Principles"—"1—The American Paper and Pulp Association is a federated organization, representing the paper industry in all matters of general interest.

"2—The function of the American Paper and Pulp Association is to handle the industry's major common problems and to co-ordinate and direct those services or activities which affect all mills in every branch of the industry.

"3—All associations established for the purpose of rendering service to the entire industry, regardless of grades or product, should come under the direction of the American Paper and Pulp Association.

"4—Groups of manufacturers making similar products and thus having similar problems should form their own independent associations to take care of those problems. These independent associations should be affiliated with the American Paper and Pulp Association in order that it may effectively represent the interests of the entire industry.

"5—The federated association should make a continuous effort to form constituent groups and to bring them into affiliation with it. The secretary of the American Paper and Pulp Association may have occasion to act temporarily as secretary of the groups being formed into associations during their development stage.

"6—Membership in the American Paper and Pulp Association should be confined to manufacturers and converters of paper and pulp or the products thereof, except as service divisions may be formed to bring such groups as the Supply and Equipment manufacturers and associations of other allied lines into the industry's organization structure.

"7—The federated association should be financed directly by its individual member mills on a uniform basis of gross sales. Its financing should be so arranged that special requests for funds will be eliminated so far as possible.

"Proposed Organization"—"Now as to the organization of the general association itself, it is evident to your committee that it is now not sufficiently representative of the paper industry, not sufficiently manned, authoritative enough, or well financed.

"The fault does not lie with those manufacturers who have in the past unselfishly and ably worked as officers and directors of the American Paper and Pulp Association, but rather is due to the fact that in the development of the association the lack of definite policies and adequate finances has hampered the carrying out of a full and complete organization.

"But we may now well look forward to the time when a man of wide experience, ability, foresight and vision, with well known executive ability, may become general manager. If he has trade association experience and a knowledge of and acquaintance in the paper industry so much the better.

"If such a man can be found there is no question of his value to the whole paper business.

"He would function under a Board of Governors elected from the ablest leaders of the paper industry, with a president and vice presidents.

"A general secretary would be responsible to attend to details of horizontal and vertical functions, and to assist in the organization of grade groups, leaving the time of the general manager to be spent on the larger affairs.

"Since the individual manufacturer finds it difficult to keep in touch with the general situation through correspondence or printed mail matter, it would unquestionably be of value to have a traveling secretary who would both discover the needs of individual members by personal contact at their plants, and interpret to them the efforts and actions of the general association in his behalf."

Plan of Financing New Organization—As to finances the committee recommended that details of any proposed plan of assessing members be left to the Executive Committee of the association, probably by some rate of payment based on the volume of business done by individual mills, having in mind that the cost should be equitably distributed throughout the entire membership and the dues be no higher than the value of the service warranted.

The committee suggested that the plans of financing and reorganization be referred to the incoming president and Executive Committee, with power to act.

In addition to Chairman Franklin, the report was signed by D. C. Everest, P. S. Fiske, C. A. Gordon, N. W. Wilson, S. L. Willson and O. M. Porter.

Development Report Adopted

Norman W. Wilson discussed the report of the Committee on Development. He said he was convinced that the plan of financing and reorganization submitted by the committee was a sound one. Referring to the queries heard from time to time regarding the value of the association and the querulous complainings of some individuals that "the A. P. & P. A. would be all right if it were more thoroughly representative of the industry", he called attention to some of the accomplishments of the association as now organized and said that if sufficient funds and a large enough staff were available much more would be accomplished. With adequate funds, the association might provide itself with better office accommodations and do better work generally. He then offered a resolution setting forth that the paper industry had grown to such proportions that it could be safeguarded only through an effective organization and moved that the report of the Committee on Development be referred to the president and Executive Committee of the association "with power to analyze and consider its application to the industry's needs, and to take such action toward the consummation of a plan, as in their judgment will adequately meet the necessities of the industry."

The motion as put by Mr. Wilson was adopted unanimously.

Before adjourning, new articles of organization were adopted. The new by-laws provide for biennial elections for president and vice president, the first election to be held at the annual meeting in 1929, so that President S. L. Willson will serve for two years. The secretary and treasurer, "or such other executive officers of the association as may be employed by the Executive Committee shall be appointed by the Executive Committee and shall hold office at its pleasure.

AFTERNOON SESSION

Resolution on Deceased Members

At the afternoon sitting which was opened by President Everest at 2:40 o'clock, the first business taken up was the report of the Committee on Resolutions, Frank L. Stevens, chairman, which was read by Secretary Porter. The first resolution voiced the sorrow of the association at the loss of the following leaders of the industry who had passed away during the year: Minor M. Beckett, Beckett Paper Company; D. W. Bergstron, Bergstrom Paper Company; Raymond D. Bertschy American Envelope Company & Miamisburg Paper Company; Howard L. Blake, Fort Hill Paper Company; George J. Caldwell, American Writing Paper Company; W. L. R. Durkee, Schroon River Pulp and Paper Company; L. L. Leadbetter, Oregan Pulp and Paper Company & Columbia River Mills; H. W. Martin, Martin Pulp and Paper Company; Levi S. Nold, American Writing Paper Company; John L. Perkins, American Tissue Mills, Inc.; James M. Ramage, Franklin Paper Company; W. F. Robertson, Robertson Company; W. H. Sullivan, Bogalusa Paper Company; U. M. Waite, Analomink Paper Company; Henry J. Wantland, Terre Haute Paper Company; James P. Munroe, Munroe Felt and Paper Company.

At the suggestion of President Everest the resolutions were adopted by a rising vote, the assemblage remaining standing for about a minute as a tribute of respect.

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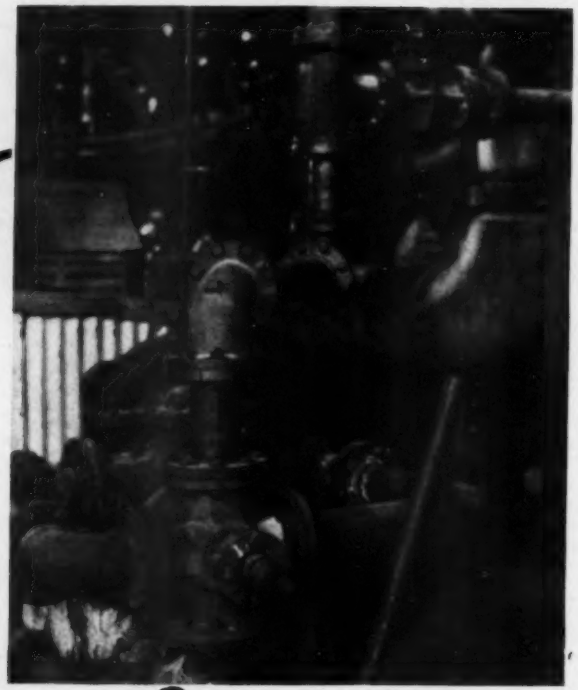

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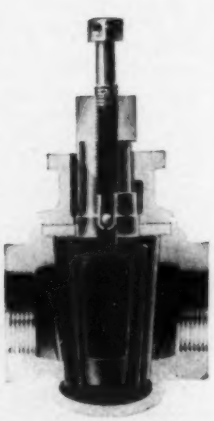

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Other Resolutions Adopted

Other resolutions were then presented in order and adopted separately by motion from the floor. These included one urging Congress to increase the appropriations for research in pulp and paper at the Forest Products Laboratory to the total authorized by the McSweeney-McNary Act.

Foreign trade was the subject of another resolution in which the association undertakes in co-operation with the United States Department of Commerce to encourage the formation of export associations in order to augment export trade in paper and paper products. The association will, under the terms of another resolution, co-operate with the Bureau of the Census to hasten the publication of census data, "to clarify and broaden the census classifications, to assist in the conduct of an annual census of production and mill capacity, and to facilitate the recently authorized census of distribution."

Watson Bill Opposed—Opposition to the Watson coal bill was voiced in a resolution in which it was set forth that the Watson bill now pending in Congress provided for the establishment of a commission to govern the bituminous coal industry by fixing prices, assigning markets and dictating details of mine operation, employment, etc., and would thus substitute government operation and set a precedent that might ultimately be extended to all industries. The principles involved in the Watson coal bill were disapproved and it was resolved that the association urge the preservation of the sound relationship between the government and the business activities of the citizens of the United States, which have existed since the establishment of independent government.

Calendar Simplification—The proposal for an international congress on "Calendar Simplification" was endorsed and the secretary was instructed to communicate with Chairman Stephen G. Porter, of the House Committee on Foreign Sales to signify their support of House Joint Resolution 334, the action to be communicated also to George Eastman, chairman of the National Committee on Calendar Simplification for the United States. The proposed legislation has in view the adoption of an international fixed calendar of thirteen equal months.

Cellulose Sources, Research and Utilization

Dr. Charles H. Herty was introduced following the adoption of the foregoing resolutions to address the gathering on certain sources of cellulose in the South, particularly the tree known in Florida and Georgia as slash pine, also called Cuban pine, **Pinus Cubensis**, or as **Pinus heterophylla**, his main purpose, as he said, being to bring the paper and pulp industry and the naval stores industry into closer relations. Slash pine is the greatest of all producers of the oleoresin, from which spirit of turpentine and rosin are manufactured.

Present and Potential Wood Supply—Dr. Herty began his talk with a statement of the present and potential wood supply for American paper mills in Canada and northern United States. He pointed out that paper manufacturers in the United States who are now procuring a good portion of their supply of pulpwood across the border appear to have little fear that this source of supply might be cut off, and emphasized that a recent statement made officially in Canada was to the effect that the Canadian government hesitated to embargo or tax the export or pulpwood primarily because it was afraid it would injure and hamper colonization. He added that paper manufacturers in the United States should appreciate fully that almost constant pressure that is being brought to bear on the Canadian governmental authorities to ban the export of pulp timber, and stated that he merely mentioned this as something for paper manufacturers in the United States to ponder over, and as a preliminary to his subsequent remarks.

Slash Pine Matures Rapidly—Doctor Herty illustrated his remarks with lantern slides showing the remarkably rapid growth of slash pine in Georgia, the pictures thrown on a screen depicting the stages of growth of saplings into trees, and also showing the methods adopted and equipment used in the South for preventing and fighting forest fires.

He stated that the growth of slash pine in Georgia was more than seven and a half times faster than is the growth of red or white spruce in northern United States and in Canada, and emphasized the importance of this to the paper manufacturing industry. It is well known to sulphite chemists that wood rich in rosin cannot be pulped by the ordinary sulphite process, but Doctor Herty told of experiments conducted at the Brunswick, Georgia, plant of the Hercules Powder Company to determine the amount of rosin contained in slash pine. The results showed the presence of 2.09 to 2.79 per cent of rosin as extracted by gasoline and alcohol, respectively. Dr. Herty had the gasoline extract titrated with a standard solution of alcoholic potassium hydroxide and the amount of rosin in this extract estimated. On this basis it was shown that not only two-thirds of the residue was rosin and that the wood consequently contained but 1.38 per cent of rosin, Doctor Herty thought that this should stimulate further inquiry into the possibilities of slash pine as pulpwood. The figures might prove different from the percentage of rosin contained in mature trees and he agreed that caution was necessary in making use of them in calculations to which any great importance was attached.

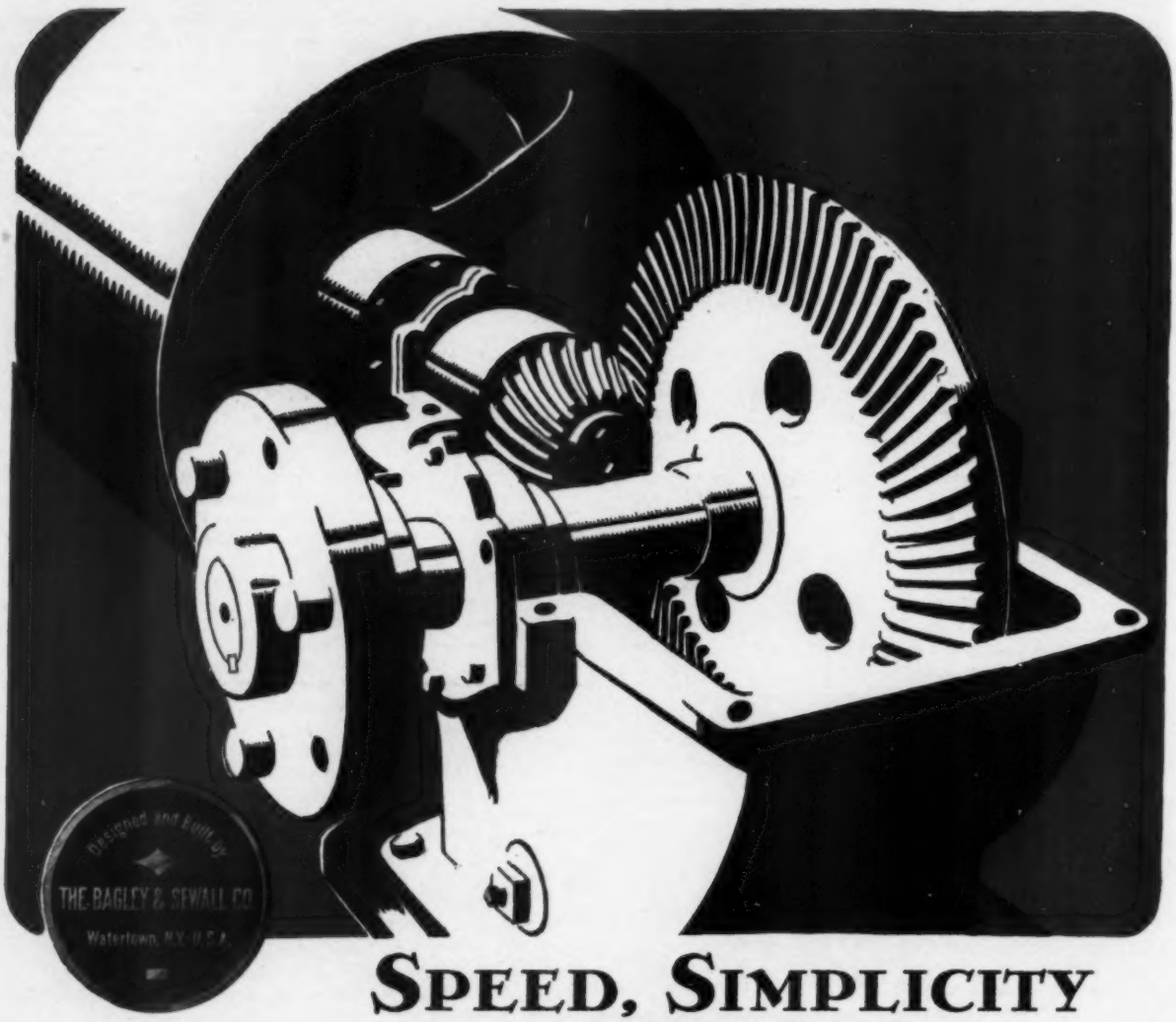
To Bring Two Industries Together—But Doctor Herty said that the vision he wished to present was a combination of the paper and pulp industry with the naval stores industry, particularly in the slash pine region where not a question of waiting sixty years for a return on capital invested in reforestation was involved, but only a period of ten years before cash returns from naval stores produced and from pulpwood would be available. He suggested the desirability of a group from the pulp and paper industry sitting around a table with a similar group from the naval stores industry and discussing these matters freely in order to determine if here might not lie the future for both industries. He said: "You do not know the naval stores industry. They do not know your paper and pulp industry. My confident belief is that rich returns will follow such a co-operative movement."

Formation of Cellulose in the Plant—He dwelt at some length on the technical side of cellulose, describing the natural formation of cellulose cells in vegetation in a manner easily understandable by the layman, and flashing several lantern slides to illustrate his remarks.

"How is this cellulose, upon which your billion dollar capitalization depends, produced in nature? This lantern slide shows you a cell-section of a leaf. You will note at the top the upper epidermis; immediately below are the palisade cells, their formation easily suggesting the name, below these come the mesophyll cells and at the bottom the lower epidermis. In these latter layers, there is shown one of the many stomata of the under side of the leaf, entry ports for carbon dioxide and moisture. In the palisade and mesophyll cells are small bodies known as chloroplasts, wherein is located the green pigment of the leaf. Do you realize that the chloroplast is one of the most important of all organic chemical factories? For here the carbon dioxide and water which enter through the stomata are elaborated into starch and sugar, perhaps through the intermediate stage of formaldehyde, and eventually into cellulose. That is the basis of plant life. Animals feed upon plants, man feeds upon both. Human life, therefore, depends directly upon the efficient functioning of these chloroplast bodies.

In the operation of these tiny organic chemical factories two things are of fundamental importance, light, or solar energy, and temperature. Chemical reactions, in general, take place better at higher temperatures. Indeed, the discovery of fossil ferns in Greenland indicated plainly that this bleak land must once upon a time have enjoyed a tropical climate."

A Plea for More Research—In a plea for the founding of a cellulose research institute or perhaps support of cellulose research in educational institutions, he spoke of the valuable work which was being done in Germany by Dr. Kurt Hess and his fifteen trained chemists, supported strongly by the industry. By Professor Herzog, in a special institute, working on fiber chemistry by all of the modern physical methods. Prof. Hans Pringsheim was busy at the University of Berlin with the backing of the wood distillation



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industry; and in Scotland at St. Andrews University, Sir James Irvine was making notable contributions. The Canadian Pulp and Paper Research Institute was mentioned as one supported jointly by the Canadian Pulp and Paper Association, the Canadian government and McGill University and by contrast showed how pitiful was the activity along these lines in the United States.

Trade Practice Conferences

President Everest then introduced Judge William E. Humphrey, of the Federal Trade Commission, who spoke on the subject of "Trade Practice Conferences", and who launched into a rather detailed analysis of the procedure, purpose and effect of such conferences under the auspices of the Federal Trade Commission.

Judge Humphrey said that the primary purpose of the trade practice conference is to enable an industry, with the co-operation of the commission, to rid itself of any unfair practice; in other words, to provide an opportunity for an industry "to clean its own house".

When a sufficient number of the members of an industry, to give reasonable assurance of its success, request it, the commission will call a conference with those engaged in the industry, and a member of the commission will preside over that conference. It is a conference of the industry; those composing the industry run and control it, and at such conference, any question may be discussed that the majority desires and that they think is of interest to the industry. After discussion, the rules or code of conduct adopted by the industry are submitted to the commission for its approval. These rules are usually divided into two groups. Group 1 rules state practices that are in violation of the law; these the commission approves, and their approval simply means that the commission expects the industry to observe the law. Group 2 rules are those that do not state practices that violate the law but the observance of which the industry believes would be to its advantage. The commission accepts these latter rules as the expression of the industry.

Illustrations of Their Value—The speaker demonstrated the value of the trade practice conference and its workings by giving a few illustrations from the forty-five conferences the commission has held with various industries, including some of the largest and most important industries in the country—and mentioning specifically the furniture industry, the correspondence school industry, the artificial silk industry, the wholesale fur industry, and the periodical publishing industry—and citing the results achieved therefrom.

Officers Elected

President Everest then called on Henry W. Stokes, as chairman of the Nominating Committee for nominations for officers of the American Paper and Pulp Association for the ensuing year, and the following nominations were made and the election was by acclamation after the president had asked for additional nominations from the floor:

President, S. L. Willson, of the American Writing Paper Company, Holyoke, Mass.

Vice President, Felix Pagenstecher, of the Bryant Paper Company, Kalamazoo, Mich.

Vice President, Milton E. Marcuse, of the Bedford Paper Company, Richmond, Va.

Secretary-Treasurer, Major Oliver M. Porter, of 18 East Forty-first street, New York City.

Executive Committee: President Willson, Vice Presidents Pagenstecher and Marcuse, and Hugh J. Chisholm, of the Oxford Paper Company, New York City; A. R. Graustein, of the International Paper Company, New York City; D. Clark Everest, of the Marathon Paper Mills Company, Rothschild, Wis.; C. B. Morgan, of the S. D. Warren Company, Boston, Mass.; Norman W. Wilson, of the Hammermill Paper Company, Erie, Pa.; and George W. Gair, of the Robert Gair Company, New York City.

Mr. Stokes escorted the newly-elected president to the rostrum, and Mr. Willson, briefly, thanked the members of the association for what he termed was the "highest gift in the industry" that had been conferred upon him, and pledging his best efforts to maintain the efficient record of his predecessors and to keep the association abreast with the changing conditions within the industry, and appealed to all the members to give their full support and co-operation during his administration of the association's destinies.

The meeting thereupon was adjourned, amid vociferous applause for the new president.

Waste Utilization and Stream Improvement

Engineer of the American Paper and Pulp Association Reports Progress of Improvements

AT A luncheon meeting of the National Committee on Waste Utilization and Stream Improvement on Wednesday afternoon, February 20, C. M. Baker, engineer of the American Paper and Pulp Association reported on the activities of the committee.

The appointment of a national committee on waste utilization and stream improvement was authorized by the American Paper and Pulp Association, February, 1926, and in June of that year steps were taken to collect funds and employ an engineer. It was not, however, until November, 1927, that the funds were raised and an engineer selected. After a year of activity the result of a survey indicated a net value of fiber formerly wasted and now utilized of upwards of $5,000,000 annually, but a potential loss in fiber wasted that it was practicable to recover of over $6,000,000 annually. This was pointed out in the pamphlet entitled "Profit for the Paper Industry through Waste Utilization and Stream Improvement" published by the American Paper and Pulp Association in September, 1928.

Activities of A. P. & P. A. Engineer

Enumerating the activities of the engineer, Mr. Baker said that they consisted of representation of the industry before state and federal officials and other organizations interested in stream improvement with a view to develop definite, co-operative programs or policies, and thus check the tendency toward radical legislation. Also included in the program were the fostering and co-ordination of research and the collection and dissemination of information.

In order to carry out this program, committees of the industry were organized in a number of states to represent certain classifications of manufacture, as strawboard, paperboard and sulphite pulp. In this way joint meetings of industry, state officials and others interested in stream improvement were arranged and attended by the engineer.

State Organizations Effected

The report described the activities of the committee in various sections of the country. In March, 1928, a committee for Connecticut was organized, with H. E. Hasty, Robert Gair Company, Montville, as chairman. In Indiana, a committee was organized November 21, 1928 with Frank Shew, United Paperboard Company, Inc., Eaton, chairman. Conditions in Indiana were rather serious on account of the aggressive action taken by sportmen's organizations, and the situation was critical for certain of the industries in Indiana, one mill having closed in order to avoid injunction proceedings.

In Illinois, no committee has yet been organized though the situation of that state is similar to that in Indiana. Jurisdiction pertaining to stream pollution is vested in three different state departments, which makes it difficult for the industry to know just with whom to deal. Maryland is organized with Abel Wolman, chief engineer of the State Department of Health, as chairman. This committee was organized prior to the association's activities. The same is true of Michigan where a committee organized in co-operation with state officials previous to the national committee's activities is headed by Felix Pagenstecher, of the Bryant Paper Company, Kalamazoo, in whose hands developments in that state are now concentrated.

The Minnesota mills organized a committee December 21, 1927. All mills of the state, state departments, and the Isaac Walton League were represented at the organization meet-

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BLEACHED SULPHITE

TOTEN — UDDEHOLM — THURBO

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ing. C. K. Blandin, president of the Itasca Paper Company, of Little Falls, is chairman, and a co-operative program has been developed between the State Board of Health and each mill in the state. The activities of the association have operated to co-ordinate and harmonize the situation between industry, state officials, the Isaac Walton League and similar organizations.

Legislation in New York

In New York State, a bill was introduced into the legislature last year for the regulation of stream pollution, which was deemed unfavorable to industry and it was defeated. In order to bring about a better understanding between the interests affected, a conference of the various industries involved was arranged in Buffalo which was attended by the engineer of the American Paper and Pulp Association. Mr. Baker called attention to the legislation now in force in Wisconsin, saying it was typical of modern tendencies and reasonably satisfactory to all concerned. The representatives at the conference endorsed this general type of legislation and a bill was drafted which was later considered in joint conference by state officials, representatives of the Isaac Walton League and other sportmens' organizations. It was feared that opposition to the bill would arise in the legislature and instead of agreeing upon it it was decided to sponsor an appropriation to the S. B. H. in order to provide for an investigation and report upon conditions in the state.

The Situation in Ohio

Coditions in Ohio as confronted by the association's engineer in 1927 indicated a lack of co-operation on the part of the industry with state officials, a view which was concurred in by Henry P. Carruth, general manager of the Mead Pulp & Paper Company, Chillicothe, who was the chairman of a state committee that had been organized prior to the association's activities. It developed, however, on closer study that nothing definite had been requested of the various mills and not knowing what to do nothing specific had been accomplished. It was suggested that analytical work be undertaken to study the character of wastes and their effects upon the streams into which they were discharged. This received the approval of the State Board of Health and the program was now being carried out. The present legislation in Ohio appears to be satisfactory, according to the committee, but more funds are needed by the State Board of Health to extend and complete their co-operative program.

Investigation in Pennsylvania

Work in Pennsylvania for the elimination of wastes and purification of streams was undertaken prior to the association's activities and under the direction of W. L. Stevenson, State Department of Health. Investigations were conducted on the biochemical oxygen demand of paper mill wastes, the efficiency of savealls and the character of paper mill wastes at the point of discharge into the streams. The results of these investigations are not yet available in printed form.

Good Work in Virginia

Virginia has a general committee of all industries interested, with J. P. Hummel, president of the Hummel-Ross Fibre Corporation, representing the paper industry. An outstanding piece of work in the harmonizing of activities was carried on in this state, according to the committee. In July, 1928, an active program for stream improvement in Virginia was initiated by the Isaac Walton League. The engineer of the association got in touch with the association and suggested a conference between the interested parties. This was arranged and a committee appointed consisting of one representative each from the Isaac Walton League and the Virginia League of Municipalities, three state officials and four representatives of industry appointed by the Virginia Chamber of Commerce. This committee raised a fund $7,500 to initiate the work before the next meeting of the legislature in 1930. The association's engineer has assisted in organizing a program of investigation and research and all concerned are apparently well pleased with the progress made.

West Virginia was to have a general conference last month at which questions of legislation would be discussed with mill and state officials. The situation was deemed rather critical there.

Stream Pollution in Wisconsin

Under the operation of a state committee headed by H. A. Rothchild, of the Kimberly-Clark Company, Neenah, a co-operative program between state authorities and the paper industry has been carried on since 1926. The results of an investigation in that year resulted in a report "Stream Pollution in Wisconsin" which contains the most complete data in regard to paper mill wastes and stream pollution yet published. The investigations have been continued during 1927 and 1928 and a report will be ready for distribution sometime this month covering the activities.

The association's engineer reported no contact with the Southern States or the Pacific Coast. The work of research committees connected with straw board mills and sulphite pulp mill was touched upon in the report. In concluding his report, Mr. Baker said that much useful data and information had been accumulated and that mills confronted with the specific problems could procure pertinent information by communicating with him. The address of the association's engineer is C. M. Baker, 2 South Carroll street, Madison, Wis.

Annual Banquet a Gala Affair

Fun and Good Humor Prevail in Absence of Serious After-Dinner Discourses

THE fifty-second annual banquet of the American Paper and Pulp Association, the last of the long series of similar events held in the grand ballroom of the Waldorf-Astoria Hotel, brought together one of the largest gatherings of paper manufacturers, paper merchants, salesmen and engineers connected with the industry that has ever marked the close of an annual convention of papermakers at the Waldorf-Astoria. The attendance at the fiftieth anniversary celebration in 1927 was exceptionally large, but that was an exceptional event. Next year's convention and banquet will take place at the Hotel Pennsylvania, the only other hotel in New York with equal facilities for holding meetings on the big scale provided by the American Paper and Pulp Association. Oscar of the Waldorf, renowned the world over as a maitre d'hotel, and who has personally superintended all of the affairs of the association held at the Waldorf during the past thirty-two years, was called to the platform at the close of the banquet and made an affecting farewell speech. In the course of an intimate talk to the diners he gave out the information that another Waldorf-Astoria may be erected in New York within a few years, an announcement which evoked cheers, renewed after he expressed the hope that he would there renew old acquaintances and form many new ones among the papermakers.

At the speakers' table, presided over by D. C. Everest, returing-president, sat a number of ex-presidents of the association and guests of honor, including Dr. Emil Heuser, Judge W. E. Humphrey, H. W. Mathewson, Felix Pagenstecher, Henry W. Stokes, President-Elect Willson, Norman W. Wilson, A. B. Daniels, W. J. Raybold, Rev. Dr. Nehemiah Boynton, George W. Sisson, Jr., and the entertainers—"Senator" Edward Ford and "Sir" John Edmiston. The identity of "Sir" John had been kept secret and the audience was amazed, at the conclusion of his performance, to learn that he was John E. Daniels, of Boston, Mass. Until this denouement, "Sir" John was supposed to be the proprietor and editor of a Scottish newspaper, who had come to this country three years ago as a non-official observer with the British Industrial Commission, and later with a party of British journalists brought here under the auspices of the Carnegie Foundation for Peace. He spoke with a good Lowland Scots accent and sang "Annie Laurie" with great effect. His address contained some pungent comments on American life and manners which rather startled his audience, but he was forgiven for his caustic criticism when he doffed his whiskers and stood revealed as a New Englander. The address of

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"Senator" Ford was also a humorous commentary on the political and social conditions of today delivered in a drawl that surpassed that of Mark Twain. He kept his hearers convulsed with laughter, and it will thus be understood that the speaking at the banquet was in marked contrast to the serious program to which members are accustomed.

Another innovation at the banquet was the introduction to the audience by Toastmaster Everest of noted guests at the speakers' table, who arose and bowed as their names were announced. Before starting the entertainment program, Mr. Everest read a letter from Judge Charles F. Moore who expressed his regret as an old friend of the association at his inability to attend the banquet. He had more reasons than one in wanting to come to New York from Lewisburg, W. Va., where he is now residing, but his doctor would not consent. After a reference to his long and pleasant association with the industry, he acknowledged the loyal friendship and affection of his innumerable friends, his letter ending with a hearty expression of good wishes for the peace and prosperity of the American Paper and Pulp Association. Then followed the humorous addresses by "Senator" Ford and "Sir" John Edmiston.

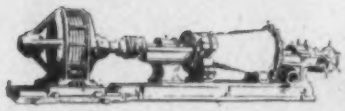
The Rev. D. Nehemiah Boynton brought the banquet to a close with one of his characteristic talks to his friends in the industry, in which he paid a splendid tribute to Oscar of the Waldorf, as a man who had made a competency for himself after beginning at the bottom of the ladder—a man who will never know the number of people who because of his efficency and courtesy have learned to call him friend.

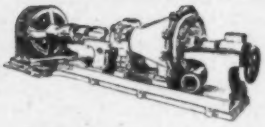
The Radio and Forestry

Radio communication with London has been established, messages are being received from Commander Byrd in the Antarctic, and the short and long ether waves are received in mines and caves deep under the ground; yet, with all advances that have been made in radio, it is rather startling to find that difficulty is encountered in establishing radio communication in the forest.

As explained by the New York State College of Forestry, the transmission of radio energy is affected to an unknown extent by what is called absorption by trees, this occurring in spring, summer and fall when the trees are sappy. The problem is now being studied by the United States Signal Service under authority of law providing for research. The radio would be a great boon to private owners of forest lands as well as the National and States government in the protection of their forest properties against the ravages of fire, and eliminate approximately 40,000 miles of telephone lines on the national forests.

Picture taken at the fifty-second annual banquet of the American Paper and Pulp Association, February 21, 1929, at the Waldorf-Astoria Hotel, New York City



..heavy stock or light coarse paper or fine  a Noble & Wood Jordan makes it-*better*!

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Papers Read and Discussed at T.A.P.P.I. Meeting

Association Grows in Membership and Work of Committees and Divisions Reveal Its Value to the Industry

THE fourteenth annual meeting of the Technical Association of the Pulp and Paper Industry was opened by President E. C. Tucker in the Myrtle Room of the Waldorf-Astoria Hotel, New York, on Tuesday, February 19, at 10 A. M., with the reading of the president's address. This began with a statement that the association was now in a position to be of service to the industry more favorable to real accomplishment than ever before. With the membership increasing at a rapid rate, it was necessary to keep constantly in mind the goals that it was desired to reach; the work of the association must be outlined clearly in order that new members be imbued with the generous and helpful attitude characteristic of the association in its earlier years.

Praise for Standing Committees—President Tucker praised the work of the standing committees, saying that the accomplishment of the association was the accomplishment of these committees whose work was the most important of any done by the association. He made a plea for the support of the committees urging that the chairmen be properly backed up by alert and willing members.

Success of the Fall Meeting—He touched on the success of the meeting held in Wausau, Wis., last fall and expressed appreciation of the excellent work done by the local committee. He spoke also of the hospitality of the Wisconsin paper manufacturers and expressed to them the appreciation of the association.

The development of the pulp and paper industry on the Pacific Coast has resulted in the formation of a Pacific Coast section of T. A. P. P. I. in a tentative way. If proper arrangements can be made so as to accord a certain freedom of action to members and prospective members, the Pacific Section of T. A. P. P. I. will be an established organization by the fall of the year.

He pointed to the increase of membership in foreign countries and said the association was proud of the type of men who are applying for membership.

The T. A. P. P. I. and A. P. & P. A. Reorganization—Referring to the proposed reorganization of the American Paper and Pulp Association he said that the Executive Committee of T. A. P. P. I. had been in close touch with the development of plans and was desirous of co-operating fully in any movement which would benefit the industry. Caution was necessary, however, and the necessity of a careful determination of how any proposed plan might affect the ability of T. A. P. P. I. to be of greatest use to its members and the industry was plainly expressed.

To Support A Fellowship at Madison—In regard to finances, the state of the treasury was so satisfactory that the Executive Committee now feels justified in financing to some extent a fellowship at the Forest Products Laboratory, Madison, Wis. It is proposed to appropriate $1,000 annually for three years.

Bibliography of Papermaking—Under Service to Members he spoke of the value of this feature of the association's activities and also of the employment bureau operated in the secretary's office. In closing he called attention to the publication of a "A Bibliography of Papermaking", by Clarence J. West and commended the author for the painstaking care and thorough excellence displayed throughout the volume.

No particular disposition was made of the president's address though it will probably take the usual course and be incorporated in the proceedings of the meeting.

Report of the Secretary

The annual report of the secretary was read by Ronald G. Macdonald. It began by recounting events of outstanding importance in the history of the association during 1928. Summarized these included (1) greatest increase in membership for any single year; (2) a great improvement in financial status; (3) recognition of outstanding merit relative to the technical development of the industry and presentation of gold medal; (4) publishing of four valuable books; (5) holding of the best attended and most interesting fall meeting; (6) increased interest in inquiries handled under the Service to Members Plan.

Growth of Membership—Secretary Macdonald reported the election of 187 new members during the year. On December 31, 1928, the total membership was 901, divided into 598 active, 208 associate, and 95 junior members. Fourteen pulp and paper companies joined the association as corporate members. Resignations or dismissals during the year amounted to forty-seven.

Interest in special inquiries was indicated by a list of twenty-three special reports on various subjects prepared in 1928.

Detailed reference was made in the secretary's report to the organization of a Pacific Coast section of T. A. P. P. I. and the relations of the association with other organizations.

Exchanging Students—The plan for exchanging students of pulp and paper technology with Swedish and American mills received attention in the report. During the past year the Bogalusa Paper Company, Chemical Paper Manufacturing Company, the Marathon Paper Mills Company, and the Container Corporation of America have taken industrial fellows into their employ and several mills have extended the privilege of visiting their plants for brief periods. In Sweden, the Holmens Bruks och Fabriks Aktiebolag at Hallsta, and Kramfors Aktiebolag at Kramfors have accepted American fellows, John F. Olson and W. F. Gillespie being appointed.

Committee Activities—The activities of committees were touched upon. The association last year had seventeen committees and new committees had been formed on Fine and Special Papers and Waste and Corrosion. Until this year the work done on determining pulp testing methods had been handled by the Sulphite Pulp Committee. In order to concentrate more fully on this subject, a Committee on Physical Standards for Pulp was formed. Interest in the technical and manufacturing problems of paperboard mills has also led to the formation of a Committee on Paperboard.

Committee on Power & Mechanical Engineering—The report recommended that the Committee on Materials Handling be merged with the Heat, Light and Power Committee and that the name of that committee be changed to Committee on Power and Mechanical Engineering.

Finances of the Association—Reporting as treasurer, Mr. Macdonald said that the total income during the year amounted to $29,095.69 and the disbursements, $21,012.45, leaving a balance of $8,083.24.

As the treasurer's report was really an auditor's report, it was accepted and took the usual course.

Outlines of Committee Work

Apart from the reading of the president's address and the secretary-treasurer's report, almost the entire forenoon ses-

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sion was taken up with outlines of work to be discussed at sectional meetings. A nominating committee was appointed with instructions to report on Thursday afternoon, and in the absence of Dr. Clarence J. West, Secretary Macdonald outlined the report of the Committee on Abstracts. In this attention was called to the publication of a "Bibliography of Pulp and Paper Making", containing 18,000 citations. The book is published by Lockwood Trade Journal Company at $10.

Two papers were scheduled for presentation at the morning sitting, but only one was given. This related to the mechanism of pulp and paper drying.

Scientific Study of Drying Operations

The paper by T. K. Sherwood, assistant professor of chemical engineering, Worcester Polytechnic Institute, represented in part a thesis submitted to the Massachusetts Institute of Technology, in partial fulfilment of the requirements for the degree of Doctor of Science. The general mechanism of drying received attention and an analysis of data on the drying of pulp and paper was given. In the case of the commercial pulp or paper dryer, the author said that there were possibilities of greatly improving the machine capacity by the proper use of air jets directed at the surface of the sheet. Graphs accompanied the paper on which were plotted the drying rate as compared with the speed of the sheet in its passage over the dryers. Factors adversely affecting the rate of heat flow to the sheet were instanced. The steam film resistance was shown to be greatly influenced by rusting of the inside surface of the dryer, by oil entrained in the steam when exhaust steam is used, by poor removal of condensate and especially by the presence of air in the dryers. The best method of maintaining the steam free of air was stated to be that of fitting each dryer to a small petcock cracked slightly all the time.

The general meeting was then adjourned until Thursday.

DIVISIONAL MEETINGS, TUESDAY

Discussion on Cellulose

The Cellulose Division held a well attended meeting in the Myrtle Room under the chairmanship of W. E. B. Baker, when Dr. John L. Parsons presented a paper on cellulose chemistry developments, Dr. Emil Heuser reviewed the chemistry of lignin and Royal S. Rasch presented a study of so called super alpha-cellulose. Rasch's paper elicited most discussion.

Determination of Alpha-Cellulose in Pulp

The paper by Dr. John L. Parsons, of the Hammermill Paper Company, constituted a review of the work of the Cellulose Division of the American Chemical Society, of which he is the chairman. One of the principal activities of this division was concerned with the preparation of an extremely pure cellulose according to a specific standard procedure, so that an identical, well defined compound might be available for the use of research workers. The Cellulose Division of the A. C. S. was not satisfied with the ordinary analytical methods of determining the purity of a cellulose material, which are concerned with the ash, copper number, alpha-cellulose, furfural, or pentosan, etc. These methods are extremely empirical in their nature. Two committees of the Cellulose Division of the A. C. S. have published tentative standard methods for the evaluation of cellulose quality and Doctor Parsons called attention to these. One provided for determining the viscosity of cellulose in cuprammonium hydroxide, which is a routine procedure among users of chemical pulp. Depending upon the method employed, the viscosity may vary greatly and the need for a standard process was felt.

Standard Alpha-Cellulose Method—Doctor Parsons cited the method for determining alpha cellulose in pulp which had been adopted as a tentative standard method by the American Chemical Society, details of which were published by Dr. George J. Ritter in **Industrial and Engineering Chemistry**, analytical edition (January 15, 1929). This method has been tried in eight laboratories on samples of cotton linters and sulphite pulps and has been found to give the best results of all the procedures tested. The alpha-cellulose method recommended by the division is as follows:

"Preparation and Conditioning of Sample—The cotton is given no preliminary treatment. Pulps are cut into 0.5-inch (1.25-cm.) squares. The material to be used for moisture and alpha-cellulose determinations is placed in a glass-stoppered bottle or equivalent fruit jar for forty-eight hours to attain a uniform moisture content throughout the sample.

"Method—Approximately a 3-gram sample, weighed accurately in a weighing bottle, is placed in a 250-cc. Pyrex beaker. Thirty-five cubic centimeters of 17.5 per cent, carbonate-free sodium hydroxide solution (17.5 grams of sodium hydroxide in 100 grams of solution) (20° C.) are added and the solution is allowed to stand for five minutes. With a short glass rod, the end of which has been flattened out to form a disk 1 cm. in diameter, the pulp or cotton is macerated for 10 minutes, adding intermittently in 10-cc. portions a total of 40 cc. of sodium hydroxide solution (20° C.) during this interval. The beaker is covered with a watch glass. After thirty minutes' additional mercerizing treatment in a water bath at 20° C. (total mercerization time, 45 minutes), 75 cc. of distilled water (20° C.) are added to the alkali-cellulose mixture followed by thorough stirring.

"The contents of the beaker are filtered immediately by means of suction on a 40-cc. Gooch crucible having a finely perforated bottom, allowing the cellulose to form its own mat. The filtrate is poured through the mat a second and a third time, if necessary, to catch any fine material. The residue in the Gooch crucible is washed with 750 cc. of distilled water (20° C.) by means of suction. The suction tube is disconnected, 40 cc. of 10 per cent acetic acid (20° C.) are added and allowed to soak five minutes. Then the suction is applied to remove the acid. The alpha-cellulose is washed with distilled water (20° C.) until free from acid. Litmus paper is used to test the filtrate.

"The alpha-cellulose is carefully removed from the Gooch to a tared, flat, glass-stoppered weighing bottle. The alpha-cellulose is opened and dried at 105° C. to a constant weight —that is, the first constant consecutive weights obtained after 1-hour heating intervals following an initial drying of at least six hours. The weighing bottle and its contents are allowed to cool in a desiccator for thirty minutes and then weighed.

"The alpha-cellulose yield is calculated on the oven-dry weight of the material. Duplicate 3-gram samples for moisture determination should be weighed out at the same time that the samples for the alpha-cellulose determination are taken."

Details of Procedure—Details of the procedure in its different steps were given. Thus in preparing the sodium hydroxide solution the sticks of alkali are dissolved in an equal weight of water and allowed to stand ten days for carbonate and other impurities to settle. The clear, supernatant liquid is decanted and diluted with carbon dioxide-free water until its density at 15° C. is 1.197. Such a solution contains 17.5 grams of sodium hydroxide in each 100 grams, a variation of 0.1 grams of sodium hydroxide plus or minus being allowed.

Commended to T. A. P. P. I.—Doctor Parsons said that he hoped this tentative standard method would receive the careful consideration of members of the Technical Association who are interested in alpha-cellulose determinations.

In closing, he gave list of papers read before the Cellulose Division of the A. C. S. to illustrate the diversified interests of its members and extended a cordial invitation to all present to attend the next spring meeting of the American Chemical Society to be held at Columbus, Ohio, April 30 to May 3, 1929.

Cellulose is Cellulose no Matter What its Source

Dr. E. Heuser's paper on the chemistry of lignin reviewed the work done during the past thirty years since the investigation of lignin was started. In reply to the query of a member he said that all celluloses are alike chemically, whether derived from spruce or cotton or any other source.

Wood Fibers Versus Rag Fibers

The greatest interest was taken in a paper presented by

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Royal S. Rasch dealing with work performed by him at the Bureau of Standards, Washington, in determining the quality of papermaking fibers. Mr. Rasch is employed by the Brown Company, Berlin, N. H., and the argument contained in his paper, reduced to its simplest form that the modern processes of purifying wood fibers make them equal to rag fibers for papermaking purposes, an argument which was disputed by a number of cellulose experts in attendance.

Summarized in the form in which he presented his paper, it was set forth by him that the sulphite process of pulping wood was so recent a development in the history of papermaking that, until a few years ago, very little definite information was available as to the actual aging qualities of papers prepared from this type of cellulose fiber. It was not known how long a carefully prepared sulphite paper could resist deterioration. Observations of authentic samples of these papers, after years of natural aging have, however, revealed that the ordinary ways of sulphite pulp are not adaptable to the manufacturer of various types of papers in which the combined qualities of great strength, durability and permanence are required. These observations, together with the well known fact that some century-old books printed on rag papers are still in existence in a high state of preservation, strengthened the belief that for these special qualities, particularly permanence, a paper of high-grade rag fibers was essential and that wood fibers were by nature, and as a result of drastic methods used to pulp them relatively weak and impermanent. Supporting this belief were the early views of cellulose chemists who held that cellulose from wood was chemically distinct from cotton cellulose. With improved methods of isolating wood cellulose in pure form has grown the belief that it is identical with cotton cellulose and subject to the same reactions.

There are available commercially at the present time purified wood fibers for papermaking prepared by special processes which make them similar in many respects to papermaking rag fibers. Owing to these similarities, the purified wood fibers are superseding rag fibers in many papers.

The interest in these purified wood fibers lies not only in their value for high-quality bond and writing papers, of the grade hitherto made entirely from rag fibers or mixtures of rag and sulphite fibers, but also very largely in their permanence qualities and thus the possibility of using them to supplant the higher-priced rag fibers in permanent record or other papers in which durability must be maintained over centuries of time. No data, however, has been available to the industry on the relative merits of this new fiber and other types of papermaking fibers. In response to a general demand for information of this kind, an investigation for the purpose of obtaining such data was undertaken by the Bureau of Standards and Mr. Rasch summarized the results obtained and conclusions reached up to the present time in this work. He said:

Results Obtained at Bureau of Standards—"The qualities of purified wood fibers, and commercial papers prepared from these fibers, have been investigated from the standpoint of chemical purity, color, durability and permanence; and compared with other typical papers and papermaking fibers.

"Tests have been made on typical commercial papermaking fibers, such as: soda pulps, sulphite pulps, purified wood pulps and rag half-stocks of different grades. A thorough study was made of the physical properties of commercial papers made from fibers similar to the foregoing. The effect of accelerated aging tests on the chemical and physical properties of these papers and papermaking fibers was determined in order to obtain information on the relative permanence of these materials.

Artificial Aging Treatments—"In order to simulate as closely as possible the deteriorating effects of natural aging, and thus determine the probable relative permanence of various types of papers and papermaking fibers, accelerated aging treatments, involving the exposure of samples to an elevated temperature, were made and the extents of chemical and physical degradation compared. It is not known how accurately such tests can reproduce the effects of natural aging; however, it seems reasonable to assume that materials possessing a high degree of stability toward the heat test would be correspondingly more permanently durable than those which manifested greater changes in chemical and physical properties.

"Representative grades of typical papermaking fibers were obtained from a number of co-operating manufacturers and their various properties compared. The more important tests made were the alpha-cellulose content, copper number, pentosan content and a determination of the color characteristics of the fibers.

Emphasis on Heat Test—"The alpha-cellulose content of a cellulose material represents the portion insoluble in mercerizing caustic. Since most of the undesirable impurities in cellulose fibers such as the modified celluloses, which may be formed as a result of drastic methods employed in processing, bleaching etc., are soluble in caustic, as high an alpha-cellulose content as possible is desired. The decrease in the alpha-cellulose content caused by artificial aging is considered an indication of relative permanence. Purified wood fibers resemble the best grade of rag fiber in changing but slightly in alpha-cellulose after an exposure to a temperature of 100° C. for seventy-two hours and are decidedly superior to ordinary woodpulps and poorer grades of rag fibers, in this respect.

Copper Number—"The copper number represents the amount of copper reduced from Fehling's solution by a given amount of cellulose material, and since it measures such reducing substances as oxycelluloses, is commonly considered a means of estimating the probable resistance of a substance to deterioration. The copper numbers of high grade rag half-stocks and purified wood fibers are considerably lower than ordinary wood fibers or poorer grades of rag fibers.

"Pentosans are present in large quantities in soda pulps and to an appreciable extent in other wood fibers; they are not contained in rag fibers. It is indicated that pentosans have little effect upon the permanency of the cellulose with which they are associated.

Discoloration Test—"The color characteristics of purified wood fibers, as determined with the Pfund colorimeter both in respect to whiteness and brilliance, and resistance to discoloration on heating are excellent, comparing favorably with the best grades of new white rag half-stock. It is indicated that the purified wood fibers would show similar good resistance to the yellowing effects of natural aging.

"A rather thorough study has been made of the durability and permanence of purified wood fiber papers in comparison with other typical commercial papers.

Folding Test Most Valuable—"All the commonly-applied strength tests such as bursting strength, tearing strength, tensile strength and folding endurance have been made on the original and artificially-aged papers. The folding endurance is generally considered the most valuable of the above-named tests in judging the probable durability or resistance of a paper to continued handling. This test is remarkably sensitive to elevated temperatures or other means of artificial aging, thus making it a valuable means of classifying papers as to their probable permanence. The permanence factors of different types of papers, as determined by the percent retention of folding endurance after a heat treatment at 100° C. for seventy-two hours, show that papers prepared from purified wood fibers react in much the same manner as high grade rag papers. It can reasonably be assumed, therefore, that the resistance of these papers to the deterioration caused by natural aging would be of the same order. Sulphite papers as well as papers containing a large proportion of rag fiber of poorer grade are very sensitive in their strength properties to heating and it is therefore probable that such papers are definitely unsuited for permanent uses."

Factors Affecting Strength of Pulps

It was 4:10 P. M. when Chairman Baker called for a discussion of Mr. Rasch's paper.

A. Aronson, of the Picatinny Arsenal, Dover, N. J., said that deterioration of a paper, or decreasing strength, might be attributed to the degree of polymerization of the cellulose molecules. The new standard method for the determination

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of viscosity could be applied to the problem. It all seemed a question of viscosity to Mr. Aronson who called attention to the three curves exhibited by Mr. Rasch for rag pulp, sulphite pulp and soda pulp which appeared to follow roughly the viscosity of those pulps. Soda pulp gets a more drastic treatment than rag pulp and has a much lower viscosity, while sulphite is in between. Therefore, the viscosity of a pulp might well be an important factor in measuring the potential strength of a paper.

B. W. Scribner, of the Bureau of Standards, said that viscosity determination had been considered but work on this had not proceded far enough to make a definite statement, though viscosity tests and age tests had been correlated fairly well. It seemed to him that the viscosity determination was important in measuring the durability of fibers. It could be applied to papermaking in the same way as it is in rayon manufacture.

Air Conditions in Testing—A. C. Walker, of the Bell Telephone Company, New York, discussed the artificial aging test by baking at an elevated temperature. Some account should be taken, he said, of the moisture content of the air in the oven if even results are to be obtained. He asked if in the test made by Mr. Rasch the air was absolutely dry or if the air contained the amount of moisture ordinarily present.

Mr. Rasch said that no attempt had been made to dry the air, certain tests made with actually humidified air showed that the results bore the same general relation.

Criticism of Heat Test—J. P. Prescott, of the Collins Manufacturing Company, questioned the value of applying heat as an artificial ager of paper. Of two papers sized with different glues one might last longer than the other on account of the glue, but where heat applied all the properties of the glue would be destroyed. He insisted that glue protected paper against the elements or the action of time.

Mr. Rasch said he knew nothing about that and admitted that it would be better if different types of paper and size could be compared in the same manner. This was planned for a later investigation. The heating test was unsatisfactory to some extent but it was all that was available by which to judge the permanence of paper.

Why the Lower Alpha Content?—Miss Kiely, of the American Writing Paper Company, inquired how Mr. Rasch accounted for the alpha-cellulose content in the glue-sized sheet when it went down. If you start with the same stock and glue-size it, what was the explanation of the lower alpha content? She referred to samples 114 and 118 of identical papers before and after glue sizing, the figures 97.5 and 89.1 were given for the alpha content before aging. How could glue effect such a difference?

Mr. Rasch replied that he had wondered about that himself but those were the results obtained. Miss Kiely could not see how tub sizing would change the alpha content of a paper. Mr. Rasch explained this by saying that if a paper contained 5 per cent of glue and it was dissolved in the caustic material it would apparently show a loss of 5 per cent alpha cellulose. He had no alpha papers without tub size.

Loss of Alpha Content by Heating—Miss Minor, who represented the Rag Content Paper Manufacturers at the Bureau of Standards, questioned if it was fair to discuss a principle of fundamental fiber qualities without testing samples in parallel conditions. How could conclusions be drawn comparing rag and alpha fibers unless tests were made on alpha fiber papers without glue sizing. The value of the discussion would depend on that comparison, having fibers without glue sizing as well as fibers with glue sizing. Mr. Rasch had referred to paper 119 of all rag content having lost 6 per cent of its alpha content by oven heating but the purified wood papers with which it was compared all contained glue size. If then 119 and 114 which had no parallel for comparison be omitted it would be found that papers made of alpha pulp lost 63 per cent more alpha content by oven heating than did all the rag papers quoted.

Ultra Violet Rays for Testing Paper—C. L. Wagner, of the J. O. Ross Engineering Corporation, said it did not seem to him that the heat test simulated actual conditions because paper was very seldom heated to 212° F. or 100° C. in actual use. During the war he did some work with the Chemical Warfare Service where an ultra violet lamp was used for testing both textiles and rubber for aging qualities. He suggested a similar use for the ultra violet lamp in the age testing of paper.

Other Methods to be Used—Mr. Scribner admitted that the Bureau of Standards had doubts about the value of baking a paper as a method of simulating natural conditions of ageing. The Paper Section of the Bureau of Standards was now investigating other methods of testing the new purified wood fibers. As to tests of glue-sized papers he was not sure whether the regular paper and the glue-sized paper had come from the same run. He was compelled to get the papers from the commercial mills and some discrepancies may have crept in. But the raw materials had been tested as well as some unsized papers and these results were more important than those obtained on glue-sized papers. It is the intention of the Paper Section to make the paper and the fiber test in their own mills, which should produce more conclusive evidence.

Mr. Prescott said that ultra violet rays had been used stepped down and chilled with ice but they still charred the fibers.

Criticism of Fibers Used—W. S. Coggeshall, of the S. D. Warren Company, said he was interested in the fibers that were tested, apart from any results obtained with the artificial ageing of papers. He thought that more samples of soda fiber should be included in the next series of tests. The alpha-cellulose and color tests on purified wood fibers, ordinary sulphite, and on ordinary soda looked bad. The purified woodpulp figures in upper 90's, while the alpha content runs all up and down the center of the color chart. But only three soda fibers were tested, of which one showed 60 and the two others less than 80. He said he did not know of any soda pulp resembling them. On the color chart the soda fibers were down in the region that he would call almost unbleached pulp.

Mr. Scribner answered this by saying that the three soda fibers referred to were obtained from three manufacturers who were among the leaders of the manufacturers of soda pulp in the United States. He expected to get more samples.

Folding Endurance Tests—Dr. Theodore C. Bentzen, of the Whiting-Plover Paper Company, asked if Mr. Rasch had made any tests on the folding endurance of purified wood fibers as compared with those of rags in the finished paper and after it had been artificially aged by heating. Mr. Rasch replied that no figures were available on that, and Doctor Bentzen then recounted some experiments he had made about a year ago on retention of fold with different papers. For a paper containing 85 per cent rag and 15 per cent sulphite the retention figure was 95, while a 25 per cent rag and 75 per cent sulphite gave 63 per cent retention. Now, he said, we are told that there is less folding endurance with 100 per cent rag than with 25 per cent rag paper. He wanted to know which was the stronger of the two papers, the rag paper or the purified woodpulp paper. From the report just presented it would appear that purified wood fiber papers were better than rag papers and he asked if this was correct.

Mr. Rasch explained that everything was rather tentative at the present time and as to folding tests he referred to the table of results in his paper.

Results Do Not Agree—Miss Kiely said she had averaged results from Mr. Rasch's report. She found from his figures that the retention of fold on 100 per cent new rag was 63 per cent and on purified wood fiber 60 per cent. On old rags paper the average figure was 53 per cent retention, but similar tests in her laboratory did not give the same results. She said that her tests proved the retention of fold of commercial all rag papers to be 250 per cent of that of a commercial all alpha pulp ledger paper, while for a 50 per cent rag ledger paper, selling at the same price as the all alpha paper, the retention of fold was practically the same as the all-alpha ledger.

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Opposing Tests—As to the tearing test which was said to be more indicative of fiber quality, Miss Kiely said that her test showed the average retention of tear for all rag papers to be 87 per cent; for 50 per cent rag ledgers it was 76.5 per cent and for the alpha ledger mentioned it was only 55.8 per cent. For the loss of alpha content due to oven heating, she had for all rag papers 2.1 per cent and for the 50 per cent rag ledger 14.2 per cent, while all alpha ledgers showed 16.2 per cent loss. The increase of copper number for all rag papers was 28.5 per cent, for 50 per cent rag paper 49 per cent and for alpha ledger 77.2 per cent. This lot of papers, she said, was obtained through a jobber and not picked in any way, while the tests were made by her routine laboratory chemists.

Doctor Johnsen on the Results—Dr. Bjarne Johnsen, of the Hammermill Paper Company, was asked to discuss the paper and said there was so much meat in it that it was difficult to pick out anything special for discussion. He considered the results interesting, especially as regards the chemical changes incidental to heating. However, he would not go so far as the author of the paper in connecting the permanence of papers with heating tests at 100° for seventy-two hours as this was an unnatural condition to which to expose the fibers. Pulp contained a certain amount of pentosans and if this pulp is heated unnaturally the fiber dries up and takes a long time for reconditioning so that it may be tested and compared with some previous results. It was only natural that if the fiber is dried out completely that the folding endurance test would be greatly reduced. He thought that a few degrees difference in the heating system or a different humidity might give more comparable results.

Doctor Heuser Commends the Test—Dr. Emil Heuser, of the Canadian International Paper Company, saw no objection to the heating test, as it only shortened what nature does during many years. It is the same thing as synthesizing coal from cellulose by heating it under high pressure with water. It shortens the time which nature takes for such work. It was the same with the comparison of papers which have endured for forty or fifty years. We are required to have a test which will permit us to predict what may happen later. It was important to purify all raw materials to be used in papers which are expected to be durable for a long period. As to sizing, it had nothing to do with the question at all except as it improved the durability of paper. The main thing was to consider the raw materials, pick out the best that could be obtained.

Caution Necessary, Says Allen Abrams—Allen Abrams, of the Marathon Paper Mills Company, thought the subject was one to be approached with a good deal of caution. In any test for paper it was desirable to get one which would indicate actual usage results. He thought a valuable piece of work had been started in attempting to get an accelerated test. He would not be in favor of drawing any conclusions until there was more certain evidence that the usage test could be paralleled with the accelerated heat test.

Glue Sizing and Paper Currency—J. P. Prescott asked Mr. Scribner if the tests for permanency reported in the paper were applicable only to unsized papers and Mr. Scribner replied that this could not be answered definitely in the affirmative. All the work done with sized paper indicated that glue sizing was not as permanent as the fiber. He instanced currency paper which has some strength imparted to it by glue sizing which is lost again in succeeding processes in the Bureau of Engraving, where the paper is washed twice, heated twice and then pounded, which approached in some measure an accelerated ageing test.

Depends on What is Being Proved—George Richter, of the research department, Brown Company, thought the impression left by Mr. Rasch's paper depended a good deal on what one was trying to prove. He said he had been listening carefully to the comments and had wondered what was in the minds of most of the people present. Apparently there was dissatisfaction with the heat test and he would conclude from this that most of the men present were not convinced that sulphite pulp would stand up just as well as rag pulp. While he did not believe that anyone competent to judge would argue that a bleached sulphite pulp would stand up as well as a high-grade fiber, some are of opinion and belief that a bleached sulphite pulp will stand up better than a poorly prepared rag paper. There was evidence, he said, that under the super drastic condition of heating described in the paper, that some of the purified wood fibers compared favorably with high-grade rag papers, and under the same drastic conditions ordinary bleached sulphite pulp did not stand up so well as rag. He thought therefore that Doctor Heuser's opinion regarding the value of the tests was well founded.

A Pertinent Question—Doctor Richter asked why, if the purified wood fiber stands up under this drastic test as well as a high-grade rag, it should not be assumed that it will also stand the test of time as well as the high-grade rag paper? If it had been found by these drastic tests that both the purified wood fiber and the ordinary sulphite fiber had fallen down when subjected to them, the conclusion would naturally have been drawn that the purified wood fiber was no better than an ordinary sulphite pulp.

Role of Acidity in Paper—Mr. Walker discussed the question of acidity in paper after Chairman Baker had asked Mr. Rasch to explain why in the tabulation of the results of tests made by him there was no parallel column of acidity, seeing that he had said acidity was a factor of extreme importance. Mr. Walker said that in his work the papers in use must have less than two-hundredths of a per cent of acidity in order to pass certain specifications. If the acidity exceeds that, the papers are subjected to different baking tests, and whether at 135° C. for 48 hours, or 100° C. for 72 hours, or 90° C. for ten days, or other temperatures and periods of time are used, it was most important to control variables such as oxygen and humidity, reduced pressure and atmospheric pressure. All tests indicated that oxidation was probably the principal factor in the deterioration of paper.

Could not Get Identical Results—Miss Kiely returned to the discussion and said that an effort had been made in her laboratory to get results similar to those reported by Mr. Rasch but without success. All her conclusions differed from those of Mr. Rasch even with the same type of oven and methods used by him. She thought that perhaps the methods employed had something to do with it.

Doctor Parsons asked Mr. Rasch what precision he had obtained in regard to the copper number determination and was told 5 to 8 per cent, whereupon Miss Kiely pointed out that some of the figures for copper number taken before and after ageing showed an increase which was within experimental error, yet 27 per cent increase, 16 per cent increase, etc., were reported and she asked if that was right. After some further discussion of moisture determinations and relative humidity the sitting was adjourned.

Election of Officers

On Tuesday and Wednesday, divisional meetings were held in different rooms of the hotel in the afternoon as well as the forenoon. On Thursday, February 21, the closing day of meeting, a short general session took place in the Myrtle Room, at which officers were elected to serve during the ensuing year. The new officers elected consisted of a president, a vice-president, two members of the Executive Committee to serve one year each, and three members to serve three years each. The slate as presented by the Nominating Committee and which was accepted, and the nominees declared elected after the usual formality, was as follows:

President—Philip H. Glatfelter, P. H. Glatfelter Company, Spring Grove, Pa.

Vice-President—M. A. Krimmel, Hammermill Paper Company, Erie, Pa.

Secretary-Treasurer—Ronald G. Macdonald, New York, N. Y.

Executive Committee—P. H. Glatfelter, M. A. Krimmel, Allen Abrams, W. G. MacNaughton, R. A. Hayward, W. O. Johnson, John S. Bates, Robert Bell-Irving, R. H. Laftman, and the secretary, ex-officio.

Messrs. Krimmel, Abrams and MacNaughton are hold over members of the committee. Messrs. Hayward and Johnson

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were elected for the one-year term and Messrs. Bates, Bell-Irving and Laftman for three years. Dr. John S. Bates, of Price Brothers & Co., Quebec, succeeds Prof. H. O. Keay as the Canadian representative on the committee.

A resolution was adopted to appropriate the sum of $1,000 for use at the Forest Products Laboratory, Madison, Wis., providing that the American Paper and Pulp Association donate $4,000 for the same purpose—namely, the investigation of specific problems. The Advisory Committee to the Forest Products Laboratory, in collaboration with the laboratory officials, will decide on the problems to be studied.

Properties of Strawboard

At a meeting of the Paper Board Division held in Room 151 on Tuesday afternoon under the chairmanship of Clark C. Heritage, Wilson W. Galloway, of the Hagar Straw Board and Paper Company, Cedarville, Ohio, presented an informing contribution relating to the property which the mill-made sheet must have in order that the converted article as consumed will be satisfactory in use. He gave the requirements for successful corrugation, the first of which was a well-wound roll of .009 straw. A soft roll becomes flattened in shipment and puts a jerky pull on the corrugator as it revolves, sufficient often to tear the sheet or snap it in two. Rolls should be hard, as free from splices as possible and the edges even and firm. The sheet must be a stiff one to answer the requirements of the box maker. A limber, raggy, soft sheet will not corrugate firmly; one of the virtues of straw fiber properly prepared is a certain stiffness without brittleness.

P. H. Glatfelter
President, Technical Ass'n, Pulp and Paper Industry

Ability to Absorb Steam—It was important, Mr. Galloway said, that a corrugating sheet should not be so stiff as to prevent the absorption of steam. Hard calendering is often responsible for a hard surface that prevents steam absorption. Some of the machines running at high speeds are now equipped with a second steam spray to moisten both sides of the sheet. Some mills form a slow corrugation, demanding a very spongy, light calendered sheet so that the minimum amount of steam is necessary. Some corrugating plants run slow enough to do away with the use of steam entirely.

Tensile Properties—Discussing the tensile strength of a straw board sheet, Mr. Galloway said that there were no complaints of quality, other things being equal, when the Mullen test exceeds twenty-two. One of the problems of the straw board manufacturer is to maintain sufficient body in the sheet at the low weights per 1,000 sq. ft., now demanded by the boxmaker, without reducing the tensile strength.

Behaviour With Waterglass—Sodium silicate is used as a glue and it is necessary that straw board will absorb the right amount of glue to hold the two outside covers to it. Length of fiber is necessary to produce this quality and there must be sufficient calendering either at the wet end or the dry end, or both, to impart the right cohesiveness to the fibers. A spongy, brittle sheet which has been scorched on the dryers will break loose when glued at the slightest strain.

Must Bend Without Cracking—An important quality of good straw board is its ability to bend in the arch without cracking. Mr. Galloway said that the proper amount of steam aided the natural qualities of the sheet. The fiber must neither be too coarse nor too short: if coarse it will break instead of bend and do the same thing if too short, so a happy medium would seem to be the thing here.

Weights Becoming Less—The question of weight per 1,000 sq. ft. was important. The weight has been reduced from an average of 39 lb. in 1922 to a maximum of 34 lb. in 1929. Each year sees a corrugated boxmaker trying to get more square feet per pound for his dollar, and the end is not yet, Mr. Galloway said. Quality is likely to suffer with a reduction in weight and the consumers have been warned by those experienced in the manufacture of the boxes that the corrugated industry would be wrecked if a stop were not put to continued reductions in weight. However with chestnut at 32 lb. or less in competition, the manufacturer of straw board has been forced again to reduce the weight from January 1, 1929. Attempts are being made to cook straw with other chemicals and lime in order to compensate the lack of weight, the success of which is yet to be demonstrated where the required stiffness is concerned. A straw sheet for corrugation is expected to have a moisture content of 7 per cent and various devices are on the market by which tests may be made. It is a custom to sample each roll and hold the moisture within close limits.

Moisture and Caliper—Moisture and caliper have not changed for a number of years. An order is received once in a while for an .008 sheet which is usually used in running large orders of single face, instead of double face material for boxes. Only a limited amount of .008 straw is made compared to the total of .009 caliper.

Summary of Desirable Qualities—In summarizing the desirable qualities of a sheet of strawboard, Mr. Galloway enumerated the following nine points, all of which were covered in his paper: Well made rolls; stiffness; ability to take steam; tensile strength; ability to hold silicia; ability to bend in the arch without cracking; proper weight per thousand square feet; proper moisture content, and proper caliper.

Mechanical Engineering Topics

The Committee on Heat, Light and Power which is now called the Power and Mechanical Engineering Committee held a sectional meeting in the East Room on Tuesday afternoon, John F. Rhodes, chairman, when papers were presented on the Ross-Grewin high pressure vapor removal system; the progress of paper mill power plants; sectional drives for cylinder molds and materials handling.

Activities of Heat, Light and Power Committee

The annual report of the Committee on Heat, Light and Power, as submitted by John F. Rhoades, chairman, noted progress by the paper industry in applying equipment for power saving, lowered costs and saving of waste. There is a great loss of production efficiency where continuity of operation is interfered with.

The committee had worked during the year on some of the more important subjects suggested by members. The papers to be presented at this year's meeting were enumerated. These included "Thermal Economies of the Steam Cycle in Industry", by H. W. Rogers and A. G. Darling, of the General Electric Company. "Paper Mill Power Plants Keep Up with the Times", by Martin Frisch and F. W. Heller, of the Combustion Engineering Corporation, with the co-operation of Carl Stripe. "The Grewin System", by H.

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G. Rappolt and A. E. Montgomery, of the J. O. Ross Engineering Corporation. "Sectional Drives for Cylinder Moulds and Primary Presses", by K. L. Hower and S. A. Staege, of the Westinghouse Electric & Manufacturing Company.

The application of heavy duty pumps for handling high consistency pulp stocks has received attention during the year. Several new pumps of both centrifugal and rotary type have appeared which it was stated were an improvement over previous models.

Information was lacking, the committee said, on friction tables for flow of stock in pipes for heavy consistencies. As no onepump manufacturer cares to bear the entire burden of carrying on experiments and compiling tables, the committee suggested that the work might best be carried out at a university. Pump manufacturers were willing to furnish pump equipment where necessary, and pulps of different kinds could be easily procured from the mills.. A university willing to do the work and having the necessary space was yet to be found.

As to future work, the committee said, more interest should be taken in chemical and engineering research to discover and apply new methods, especially for the elimination of waste and the conservation of natural resources.

Ross-Grewin Vapor Removal System

The paper by A. E. Montgomery and H. G. Rappolt described the Ross-Grewin high pressure system for removing vapor from between the paper machine driers. The system consists essentially of a small positive pressure blower for compressing the air, heating coils, and a system of headers, drops and nozzles. The nozzles deliver a jet of heated air at high velocity into the vapor pockets. At the wet end where the sheet is delicate and would likely be broken by a strong air current, a special glass pipe is used. This has adjustable air ports by which the velocity of the jet of air can be regulated. The blower and heater can be set either on the machine floor in the rear of the dryers or in the basement under them. A sketch was provided to show the apparatus in place as well as the arrangement of headers and nozzles.

The Grewin system was invented by Fredrik Grewin who used it on one of his paper machines at Norrkoeping, Sweden. The Voith Company obtained a license for the use of the patent and it has been applied to many paper machines in Europe. Within the last three years it has been introduced into North America where its advantages have been demonstrated.

The beneficial results of blowing air into the vapor pockets of board machines without dryer canvasses have been particularly appreciated. The authors state that an installation of a Ross-Grewin system can be made easily on either a new machine or an old one during the regular weekend shutdown. The apparatus requires little room.

The principal advantages of such an installation were enumerated as follows: (1) More even drying across the sheet; (2) increased drying capacity; (3) reduction of steam used per pound of finished paper; (4) longer life of felt; (5) requires minimum amount of steam and power to operate.

It was pointed out that there is ordinarily a sluggish or stagnant mass of water vapor in the pockets which prevents the center of the sheet from drying properly; either the edges of the sheet are overdried, or the center runs wet. To overcome this, the crown on the press rolls is increased so that the sheet entering the dryers may have less water in the center than at the edges. It was pointed out that this was a case of introducing one evil to offset another one, since the extra crown was injurious both to the press felts and to the fibers in the center of the sheet. By blowing the stagnant vapor away from the center, the middle of the sheet dries equally with the edges. It was found with the Ross-Grewin installation that the average amount of moisture leaving the sheet at the dryers could be increased from 5 or 6 to 8 or 9 per cent.

The production of paper increased where the Ross-Grewin system was used some 5 to 15 per cent and on one installation where conditions were unusually severe a 20 per cent increase was made. A reduction in the amount of steam used per pound of water evaporated was also noted. A decrease in back pressure was also obtained. It was pointed out that for the same power output from the turbines, the amount of steam required, or the water rate decreases as back pressure is lower. In summarizing the advantages of the system is was stated that it could be readily applied to any dryer nest using top and bottom felts to produce a more evenly dried sheet, increase the rate of drying, reduce the amount of steam required per pound of paper and increase the life of the dryer felts, with only a small consumption of steam and power to operate it, and without interference with the normal tending of the machine.

Developments in Paper Mill Steam Power Plants

In the paper by Martin Frisch and F. W. Heller at the sectional meeting of the Heat, Light and Power Committee developments in the direction of reducing the cost of steam production and increasing efficiency of boiler plants in pulp and paper mills were interestingly described. The fuel consumption of a paper mill being roughly a ton of coal per ton of paper, efficiency was important, especially if fuel costs are high as they generally are at inaccessible paper mills. Attention was called to the necessity of insuring the proper dryness of steam. Rates of evaporation of 20 to 30 lb. per hour per square foot of heating surface as compared with the 3.5 to 7 lb. rates customary in former times are now being realized daily in industrial as well as utility plants under conditions most exacting as to reliability and economy. The result is that a given boiler is good for more steam. Less boiler surface, fewer boilers and smaller boiler plants now satisfy a given steam demand. The investment in boilers, meaning the first cost per developed boiler horsepower is therefore lower.

Pulverized Coal Plants—More pulverized coal-fired boiler plants are perhaps to be found in the paper industry than in any other industrial activity (public utilities excepted). Pulverized coal burning plants can burn all grades of bituminous coals, and they can be readily adapted to burn either gas or oil whenever the fuel market warrants. The complete mixing of air and fuel is under good control in them and operating efficiencies over long periods closely approach test efficiencies.

For certain load conditions and plant sizes, the authors said the storage system of burning pulverized coal offered a means for firing boilers which was unexcelled for reliability and flexibility. It was pointed out that this was of special importance in paper mills where sudden and large fluctuations in steam demand may arise when a digester or some other steam heated apparatus is shut off or put into service. For other load conditions, the unit system might prove more economical and both were used extensively in the paper industry. Either system could be arranged so that gas or oil might be burned alone or in combination with the pulverized coal with but minor modifications to the furnace.

Improvements in stokers have followed pulverized coal installations and the authors gave details of the improvements affected. Forced draft traveling grates were of remarkable service, unique in their ability for burning coke breeze and small anthracite; some mills make use of this where the fuel supply makes it desirable. Stoker furnaces are now being water cooled like pulverized coal furnaces. The fuel burning capacities and efficiencies of underfeed stokers suitable for eastern high-grade coking coals have been greatly improved by increasing their lengths and by providing means for continually removing ashes.

Reference was made to the utility of the rear arch in producing turbulence in stoker furnaces. By means of it, low-grade fuels high in moisture and ash and low in volatile matter may be burned without ignition difficulties. Most of the air is introduced into the furnace under the rear arch from the rear air compartments of the stoker, and if the rear arch is set close to the stoker so that it may deflect the flames and burning gases toward and against the incoming fuel at the front of the stoker, it is possible to cause the immediate ignition of wet lignites, high ash and low volatile solid fuels, such as coke breeze or fine anthracite, otherwise hard to ignite without the use of heat reflection or radiating surfaces. The rear arch should be completely watercooled.

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Use of Water and Steam-Cooled Walls—The authors suggest as means of increasing the fuel burning capacity of a furnace and the corresponding steaming capacity of a boiler by putting part of the boiler around the furnace and replacing refractories with water or steam-cooled surfaces. Water-cooled surfaces make it possible to apply highly preheated air for combustion. Erosion or melting down of furnace walls does not worry the water wall user, the furnace being safe from the effects of high temperature. It was stated that combustion rates of 30,000 B.t.u. per cubic ft. per hour and coal burning capacity of 60,000 lb. of pulverized coal per hour per furnace were now being realized in water-cooled metal furnaces subject to turbulent firing with highly preheated air, and the combustion is smokeless.

High Combustion from Good Mixing and Turbulence—The development of water-cooled furnaces has led to an increase in turbulent modes of firing pulverized coal. Fuel must continually come in contact with fresh oxygen during its passage to the furnace, hence the relative movement between fuel and air must be rapid. Turbulence is produced by the impingement of flames against each other at high velocity, or by causing air jets to impinge on the flames at right angles at high velocity.

The preheating of air has its advantages as a means of economically recovering heat that would otherwise be lost. In air heaters described by the authors, thin layers of gas and air separated by metal plates flow past each other at high velocity and counter-currently. The hot air returns heat to the furnace that would normally be lost to the atmosphere in stack gases. Preheated air is used in conjunction with all methods of fuel burning. The economies derivable depend on the price of the fuel and the use factor of the plant.

As stated in the conclusions of the authors, the capacities and efficiencies of steam generating units have been extended chiefly by improving furnaces, fuel burning equipment and by the utilization of heat recovery devices such as air heaters. It was noted that the newer developments had been adopted more enthusiastically by pulp and paper manufacturers than by other industries; this was attributable in part to the fact that many pulp and paper manufacturers were also power sellers.

Sectional Drive for Cylinder Machine

In the paper on "Sectional Drives for Cylinder Molds and Primary Presses", by K. L. Howe, the advantages of individual drives for each cylinder mold and primary press were pointed out. In the past the first press felt has been used to drive these parts, though it had been generally recognized that a drive which would relieve the felt of the burden of driving the cylinder mold and primary presses and which would still maintain proper draws and proper tension in the felt between sections would be a great improvement, leading to increased life of the first press felt, besides improved formation and greatly increased strength of the sheet. Other advantages referred to were sustained capacity at maximum production, increased life of wire cloth covering on cylinder molds, almost complete elimination of felt stretch and complete elimination of felt and sheet stretch between cylinder molds and first main press.

A detailed description of the application of individual motor drives to a machine operating in a mill on the Pacific coast were given in the paper by Mr. Howe, who is connected with the Westinghouse Electric & Manufacturing Company, at the Seattle, Washington, branch. A test made before the first press felt were put on showed the precision with which the draws are maintained. Mr. Howe said: "A 2-inch linen tape of surgical braid was threaded through the machine in the usual place occupied by the lower first press felt, except that the tension rolls were omitted. When the tape had been spliced together the first main press motor together with all of the small motors were started and the machine operated in this manner with nothing to hold these sections together except the motor characteristics and this 2-inch tape. It was possible to operate the machine over the entire speed range without further adjustment, without breaking the tape and without appreciable change in its tension. Furthermore, it was possible to so adjust the tape that there was a sag between each section and this could be maintained substantially constant. Furthermore, the machine could be started and stopped in like manner."

It was stated that the performance of the cylinder machine on which the individual drives were used indicated that the life of the felts would be increased two or three times compared with the ordinary arrangement of drive.

Handling of Materials

Mechanical handling equipment as used in pulp and paper mills was described in a paper by George D. Bearce which bore the title "Progress in Handling Materials in the Paper Industry". Mechanical handling equipment should be considered in all cases where hand labor is used. The cost of handling materials such as coal, pulpwood, lapped pulp, old paper stock, etc., is determined in many plants and it is possible to figure with a reasonable degree of accuracy the savings that may be effected by the application of mechanical equipment, where the cost of manually handling any commodity is known. In all cases the cost of manual handling must be weighed against the investment in mechanical devices plus their operation and upkeep. A reasonable rule is that any handling device should pay for itself in a period of two to three years.

Shipping Paper on Skids—The use of skids and the lift truck in shipping paper is extending rapidly. Mr. Bearce quoted from a paper by F. J. Shepard, Jr., read before the American Society of Mechanical Engineers, as follows:

"In the past two years the method of packing and transporting paper has undergone a complete change. Whereas formerly all sheet or ream paper was cased in boxes weighing from 500 to 800 lb. each, it is now placed on skid platforms directly from the inspection tables. The loads vary from 4,000 to 7,000 lb. and after being covered with wrapping paper are squeezed into a solid unit by means of a rigid cover which is drawn down by steel strapping or by long bolts. A single skid platform and clamping cover replaces six to ten cases, whose cost averaged $2.50 each. The labor entailed in handling the large number of cases is done away with by the new methods.

"The direct saving at the paper mill by this method of shipping amounts to approximately $5 a ton, roughly, 3 per cent of the selling price of the paper.

"Paper-shipping platforms are of two general types, returnable and non-returnable. The first are heavily constructed with a structural-steel frame and heavy hardwood planking, and after being unloaded by the printer are returned to the mill in carload lots. The non-returnable platforms are of lighter construction, being built of soft wood, and are often supplied by the mill which formerly made up packing cases. The returnable type is commonly used by mills supplying one or two large customers, and the non-returnable type in supplying jobbers and small customers who would not be able to return the skids to the mill promptly.

"One large paper mill estimates that $30,000 invested in returnable skids paid a 100 per cent dividend at the end of ten months' use, and since that time has shown a saving of more than $120 for each working day, or $36,000 a year.

"A second New England mill, which is at the present time shipping approximately 30 per cent of its output on skid platforms, checks the figure of $5 a ton saved by shipping on platforms, and the saving at this mill amounted to upwards of $100,000 in the past year."

In another paper presented at the same meeting of the American Society of Mechanical Engineers by H. E. Stocker, the use of skids for water shipment was touched upon to show the increasing importance of this method of handling paper:

"Skids weighing 4,000 lb. are shipped by the Oxford Paper Company, Rumford, Maine, and measure 58.7 cubic feet, or 29 cubic feet to the ton. The same grade of paper in cases weighing 600 lb. measures 44 cubic feet per ton. This is largely because the paper on skids is highly compressed and then tied down with steel strapping or wire. Less broken stowage accounts for the remainder of the space saved. Six cases of 600 lb. each take up more space than 3,600 lb. of paper compressed into one solid mass. Therefore the use of skids results in a 34 per cent improvement. For the same space the revenue is 34 per cent greater, and this is of far

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greater influence on net profit than reduced handling costs. A 75 per cent saving of the latter may mean only 70 cents per ton, while a 34 per cent increase in the revenue received for the space used will amount to $180 per ton, or 157 per cent more. Of course ships are not loaded uniformly full, but nevertheless the results are impressive. Of even greater importance than this is the fact that if these paper shipments were not accepted by the steamship company because they were packed on skids, they would move via rail. The revenue remaining after deducting the out-of-pocket expense of doing this additional business far exceeds the savings in handling expenses. In addition to the Portland-New York business, the Eastern Steamship Company handles paper on skids from Boston to New York. These skids are hauled from the railroad freight station to the dock by motor truck. No tracks are on the dock at Portland.

The Boston line also carries printed sheets on skids. These are printed at Boston and bound into books at New York. The Eastern Steamship Company owns some permanent skids which are used in carrying freight between its terminals.

"Paper on skids is shipped from Ticonderoga and Mechanicsville, N. Y., via rail to Albany, thence via river lines to New York. Shipments also originate at Saugerties and other river ports. Altogether there are three Hudson River lines handling paper in this manner."

Speaking of the handling of pulp and paper stock within the mill, Mr. Bearce remarked that water was still the most economical and effective carrier. However this was a problem of pumping rather than of actual handling of material.

Belt and roller conveyors are standard equipment for handling sheet or lapped pulp. The plain belt and noodling the pulp from the wet machine is a method employed in some plants. As to paper stock and rag these are handled in different ways. The overhead trolly or monorail system and grapple can be used where the storage warehouse is properly designed. In some cases it is possible to apply a belt apron or similar conveyor.

Pulpwood Conveyors—The handling of pulpwood is a definite problem requiring special study. Pulpwood stackers are used in many modern plants. It is essential in the design of a plant to reduce the conveyor system to the smallest reasonable length to lower the cost of upkeep. A crane and wood grapple can be used in reclaiming pulpwood from a loosely stacked pile. Mr. Bearce mentioned the operation of a caterpillar tractor and wood grapple in a large Canadian plant which worked as rapidly as a steam shovel, taking a load every twenty seconds and requiring only three men to operate it—two men on the pile and one engine operator.

In the handling of lime, limestone, sulphur, clay and similar raw materials the use of belts and bucket conveyors can often be adopted advantageously. A number of mills are handling clay and similar pulverized material by air suction.

Coal handling—Coal is handled in many ways but where space is available the use of the drag scraper to and from the coal pile is perhaps the simplest, cheapest and most effective method. Cranes are also used, as well as belt conveyors, bucket elevators, scraper conveyors and similar equipment.

Mr. Bearce said that upkeep was an important problem of coal handling equipment. Every mill should make an adequate survey of their handling conditions and should try to curtail the use of manual labor.

DIVISIONAL MEETINGS, WEDNESDAY

Finished Paper Problems

On Wednesday morning, February 20, meetings were held in Room 110, the Myrtle Room and Room 131. The program in the Fine and Special Paper Division, which met in Room 110 under the chairmanship of Dr. Theobald C. Bentzen, comprised the following papers which were presented in the order given: Lithographic Paper Problems, by Robert F. Reed; Improvements in Coated Paper Manufacture, by Frank W. Egan; Deterioration of Paper by Excessive Acidity, by W. F. Hoffman; Fastness of Colored Papers to Light, by W. D. Appel and Th. C. Bentzen.

Lithographic Paper Problems

An interesting and suggestive discussion of the troubles experienced by lithographers with paper was contained in the paper presented by Robert F. Reed, who is research director of the Lithographic Technical Foundation at the University of Cincinnati. Of special value were the precautions recommended by him in the handling of paper, in order to obviate or minimize difficulties in securing proper register. These were stated as follows:

(a) The manufacture of paper having a minimum tendency to expand and contract with changing moisture content. This can be accomplished by avoiding hydration of the pulp fibers in the beater and securing the maximum uniformity of distribution of the fibers in the sheet.

(b) Maintenance of a uniform atmospheric condition in paper storage and pressrooms.

(c) Maintenance of an effective system for conditioning paper in the pressroom atmosphere or, if possible, an arrangement with the source of paper supply whereby the paper will arrive in the pressroom containing an amount of moisture that will be in equilibrium with the pressroom atmosphere.

(d) Careful adjustment of pressure between the cylinders of the press so that printing may be done with a minimum of pressure.

(e) Paper should be as rigid as possible especially in the machine direction without this affecting its other desirable properties in order that it may resist mechanical deformation. This involves control of beater sizing and indicates the desirability of a relatively hard sized paper.

The foregoing recommendations were offered for the attention of the manufacturers of paper for the offset lithographer.

In Mr. Reed's opinion, means should be found to increase the rigidity of offset paper in the machine direction without impairing its strength in the cross direction.

The chief difficulties encountered by lithographers in their printing operations was stated by Mr. Reed as follows:

1—Lack of uniformity of the moisture content of paper.

2—Lack of uniformity of the ink penetration rate or "ink resistance" of paper.

3—Differences in temperature and consequent differences in the mobility of ink.

4—Static electricity.

Some problems in the application of adhesives to paper arose, Mr. Reed said, through variations in degree of hydration of the beater stock and by variation in degree of beater sizing. He suggested a program of research on the various problems related to paper for lithographic purposes.

Improved Mechanism for Coating Paper

Improved methods and equipment for the coating of paper were described by Frank W. Egan, of the John Waldron Corporation, New Brunswick, N. J.

Mr. Egan described types of machines and spoke of the arched bed machine on which much thought had been expended for its improvement. This machine includes the best features of the cylinder and inclined bed coating machine. It will handle goods up to 110 inches and wider, eliminating troubles caused by slack edges and wrinkles.

Festooning machines have been improved in a number of ways. The old angle incline has been changed to an arched back incline so as to overcome the swaying of the loop when it is brought out and put on a horizontal carrying chain.

Perhaps the greatest improvements are to be found in the modern drying systems used in the manufacture of coated paper. In the old days the method was to just place coils of steam pipe beneath the festoons, which meant that any air movement that was obtained was due to the heat radiation from these coils. Today we find that the system generally used consists of a heater and fan which are placed outside of the drying line or to one side of the drying line, as the majority of the festooning lines for coated paper are run in an open room. A main supply duct is brought up from a point in connection with the fan outlet and is carried to a point in approximately the center and directly above the festooning machine, from which two branches are taken off and carried almost the full length of the festoon-

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ing machine. The bottom of the branches are equipped with slots either in a single straight line or staggered to suit the width of the sheet. Air is introduced down into the festoons from these slotted outlets and the velocity from these outlets is determined by the weight of the goods that are to be dried and the depth of the loops in the festooning machine. Recirculating ducts are carried from any one of several points directly beneath the festooner or from the side of the festooner, back to a mixing chamber in connection with the heater. Fresh air is brought from either the apparatus room or from outdoors and is mixed with the recirculated air which then passes through the heater and fan into the supply system.

In coating paper operations, great trouble is experienced by the paper curling at the edges after it has passed the festooning machine and is put in rolls. The remedy is to apply moisture to the sheet by the use of a conditioning unit. This consists of a fan, heater and conditioning chamber with air supply, return and exhaust lines, controlled by wet and dry bulb temperature regulators. The dry bulb regulator automatically maintains the dry bulb temperature by controlling the amount of steam used in the heater, while the wet bulb regulator operates the fresh air damper and also a steam jet. By an arrangement of this kind the proper degree of humidity can be maintained and curling troubles eliminated.

Mr. Egan suggested the use of conditioning devices in the storage rooms of coated paper plants. One of the greatest problems of the printer was the control of off register and curling of the sheet that is always encountered in coated paper that is not conditioned.

Keeping Qualities of Paper

Under the title "The Deterioration of Paper", W. F. Hoffman, for the Committee on Fine and Special Papers, presented a report on methods of measuring the keeping qualities of paper and factors in manufacturing pertaining to the subject. The factors referred to were concerned with deterioration of paper on aging, sizing, coloring, retention of filler, physical properties, operation of the paper machine and effect of varying acidities on paper mill equipment.

Alum, it was pointed out, is the cause of acidity, but acidity of the furnish or the finished paper is only one factor involved in the deterioration of paper on aging. The acidity of the furnish and of the resulting paper must, however remain under certain limits if a paper is not to deteriorate appreciably on aging. If the acidity is high the paper will deteriorate rapidly, become brittle and the Mullen test fall off.

It is excess of alum; that is, more than is theoretically needed to salt out the rosin size, that leads to acid traces in the sheet. An excess of alum is supposed to be of value in preventing foam, in setting the color, in giving a better rattle to the paper, in retaining filler, making sticky stock run satisfactorily, increasing the strength of the sheet, as well as curing many other ills of papermaking operation.

In the sizing of paper with sodium resinate, alum is much more efficient in precipitating the rosin than is acid, though both will impart the same acidity to the furnish. The optimum pH for precipitating rosin with alum in water solution appears to be about pH 5.5 and requires about 0.75 lb. of alum to one lb. of size, the amount varying according to the soda content of the size. Under some conditions, as in the use of certain dyes, a different pH may work more satisfactorily.

The addition of alum to the furnish results in the formation of aluminum hydroxide as well as acid, and it is a question in the case of retention of fillers whether the increased retention through addition of alum is due to acidity alone or to the aluminum hydroxide, or both.

The alum added to the furnish sometimes imparts desirable properties in the case of a given paper and it is thought that alum is useful in eliminating or reducing some of the difficulties encountered in running a paper machine.

It is important to bear in mind, as pointed out by Mr. Hoffman, that corrosion of the metal parts of paper mill equipment is hastened by acidity of the furnish. An acidity equivalent to pH 4.0 or less will cause corrosion to take place at a much more rapid rate than if the furnish has an acidity equivalent to pH 6 or pH 7.

In deciding upon the amount of alum to be added to a furnish, or the optimum acidity for manufacturing a particular type of paper, no one factor can be considered as determining and the amount of alum used must be based on the composite result, that is, all of the factors which enter into the manufacture of that particular paper.

Discussion of Corrosion and Waste

The Corrosion and Waste Division met in the Myrtle Room with H. L. Joachim in the chair, when the following papers were presented: Mill Water Supplies and Waste Utilization, by C. M. Baker; Invisible Shrinkage, by A. W. Pesch. (Read by J. S. Bates); Corrosion in Paper Mills, by I. R. McCall; Corrosion Resistant Steels, by J. A. Matthews; Plastics in the Pulp and Paper Industry, by C. W. Rivise.

The Water Supply of Paper Mills

In C. M. Baker's paper on "Mill Water Supplies and Waste Utilization", a general study was made of methods of waste water utilization and mill water supplies. The quality of the fresh water is sometimes such that the white water wastes of mills can be more easily purified and used over again, the quantity of fresh water used in the mill being dependent to a great extent upon the recirculation and use of white water. No two paper mill men will agree upon the amount of water necessary for production, estimates ranging from 1,500 gallons to 150,000 gallons per ton of product having been published. For a 25-ton sulphite mill, 63,000 gallons per ton of product was reported, while 6,300 gallons was the indicated fresh water consumption per ton of groundwood, and 6,100 gallons per ton of newsprint paper. In the two last named cases closed systems were employed.

Mr. Baker cited the case of a board mill that had reduced its water consumption from 28,000 to 3,000 gallons per ton of product by recirculation of the white water through the showers without savealls and he said it had been reported that one newsprint mill had operated on approximately 1,500 gallons of water per ton of product.

Water supplies for papermaking might be divided, he said, into three classifications: (1) waters of inferior quality containing dirt, sediment, iron or other impurities, which could be used in the manufacture of coarse papers and boards; (2) waters free from suspended matter but containing iron which could be used in the manufacture of newsprint, butcher's manila, catalogue, and wall paper; (3) clean clear waters free from iron and excessive hardness which are necessary in the manufacture of book, glassine, lithograph, tissue, etc.

Suspended matter was objectionable because of the dirt that was carried into the paper and the possibility of clogging showers. Iron was objectionable because it was absorbed by the cellulose fibers and caused the finished paper to turn yellow. Hardness interfered with bleaching and increased the cost of sizing.

He discussed the sources of pure water and the treatment of waters containing sediment or suspended matter. Use of coagulents and filtration represented the simplest form of treatment. Ground waters containing iron could be purified by aeration and sedimentation, though filtration was often necessary. To soften hard waters, lime, or the zeolite process can be used, but this was expensive. There appears to be some difference of opinion as to the importance of water softening, since in certain localities high grades of paper are made from hard water. It had been reported, he said, that one mill was manufacturing a high grade book paper with water containing 700 parts of mineral water in solution.

The function of water in papermaking processes consisted in the washing out of impurities, the conveying of stocks or wastes and manufacture of chemical solutions.

As to the reuse of white water, Mr. Baker said that recirculation to screen showers without savealls was being practiced in some mills. With adequate savealls white water could be recirculated on practically all showers, and the recovered fibers utilized in the products made, except perhaps in the manufacture of high grades of paper.

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He mentioned some of the advantages connected with white water recirculation and utilization. There was a substantial saving in pumping costs, capital investment and the cost of treatment. Reduction in water consumption makes for a corresponding reduction of wastes to the sewer, and it was recommended to make a careful study or survey of white water utilization in order to reduce water consumption to the lowest quantity.

Pulp Losses

A. W. Pesch's paper, bearing the title "Invisible Shrinkage", discussed the question of pulp losses in discarded white water. An increasing amount of interest is being taken in this subject by the executives of paper and pulp mills. Probably no other single factor has had more influence in causing mill executives to employ more and better trained technical help. The loss of fiber going into the rivers with white water is tremendous. Great sums of money have been spent by the industry in equipping mills with save-all apparatus and systems of reclaiming fiber and fillers from white water.

Notwithstanding this there is still a considerable loss or shrinkage in weight between pulp furnished and pulp accounted for by paper produced. Some mills show a fiber loss of 5 to 15 per cent between the beater room and the finishing room.

Mr. Pesch said he had heard more than one mill manager express himself to the effect that his investment in save-all equipment seemed to have made but little difference in his paper mill shrinkage. Notwithstanding the use of approved save-all equipment, which should keep down losses of long-fibered stock like sulphite and sulphate to about 1 per cent of the pulp, the book figures of the cost accountant appear to show that 5 to 15 per cent of the pulp supplied to the paper mill went down the river.

But Mr. Pesch is not sure that fiber losses of this magnitude really occur. He thinks it likely that the mill was charged with more stock than it received. If an investigation discloses that the losses are really smaller than those shown by the book figures, the error in the amount of pulp charged to the paper mill should be corrected.

"Invisible Shrinkage", the title of Mr. Pesch's paper, was suggested to him by what he heard concerning alleged fiber losses at a meeting some time ago. During the discussion on white water stock losses and yield of sulphite pulp per cord of wood, it was stated by one of the men present that at his mill the technical department constantly reported a much lower fiber loss than was evident by the production statistics and he accounted for the invisible shrinkage to non existent pulp production. The alleged loss could not be accounted for by pulp passing into solution through hydration in the beater. The amount of soluble ingredients that goes into a sheet of paper is so small when compared with the weight of the insoluble materials in a furnish that even a relatively large error in estimating the degree of retention of the soluble portion would involve but a trifling percentage of error when applied against the total weight of the furnish. If accurate figures on the paper production are available, the amount of pulp furnished to the paper mill will be the sum of pulp contained in the paper plus that contained in the white water. The average moisture content of the paper must be known and allowed for and if the paper contains a filler, the filler content of both the paper and the white water solids should be taken into account in the calculation.

Overestimated pulp production has a depressing effect upon the market price of paper. However there is a large difference in the reported yields of pulp from a cord of wood. Some mills report yields from eastern hemlock ranging anywhere from 800 to 1,000 lb. or more of air-dry pulp per cord. But the same mills also show high figures for paper mill shrinkage. There is harm done when the production of pulp is overestimated and the cost per ton of pulp correspondingly underestimated.

To show how the market is affected, Mr. Pesch said that many of the mills manufacturing both paper and pulp frequently have surplus pulp on hand which they offer on the market in order to keep their pulp mills operating to capacity. If the overestimated pulp production shows the book cost of sulphite to be $45 a ton, while the true cost based on the pulp actually produced is $50, then it is likely that the pulp will be offered at less than actual cost or at least at a lower figure than would be the case if the true cost were known. The final effect is a reduction of the price level of both pulp and paper throughout the industry.

It is the purpose of cost accounting to prevent this, but the cost accountant is not always provided with accurate statistics and is ordinarily obliged to rely upon somebody's estimate of the quantity of pulp produced. Hence the necessity for close co-operation between the cost and technical department. With accurate cost data the demoralizing effect of throwing pulp into the market below cost would stop and an important factor behind the "profitless prosperity" in these days of overproduction would be eliminated.

Corrosion in Paper Mills

The paper by I. R. McCall was presented in the sectional meeting of the Corrosion and Waste Committee. It treated some of the problems of corrosion with which the maintenance engineer is confronted. Electrolytic dissociation is now generally accepted as the cause of corrosion and Mr. McCall gave an explanation of the electrolytic dissociation theory. Corrosion is hastened in proportion to the amount of moisture in the air and acid present. Continuous painting and treating of iron and steel surfaces saves thousands of dollars in maintenance and replacement costs during the course of a year. Beginning with the mill dam, Mr. McCall took his hearers on a tour of the mill and pointed out what could be observed in an inspection of apparatus and equipment in different departments. The principal points brought out were that special care must be exercised in the cleaning and preparation of surfaces before painting and that the right type of paint material manufactured to meet an explicit purpose should be used.

Corrosion Resisting Steels

Dr. John A. Matthews, of the Crucible Steel Company of America, gave an interesting account of developments in the manufacture of corrosion resisting steels used in the manufacture of pulp and paper, covering a good deal of the ground traversed in his paper on the same subject read at the last annual meeting of the Superintendents' Association. The paper was discussed by several of those present.

Patent Literature on Plastics

A review of so called cellulose plastics and synthetic resins with particular reference to the patent literature, formed the subject of the paper by Charles W. Rivise. Many of these had but a remote connection with papermaking processes, though some interesting details were given of the utilization of black liquor in combination with phenols.

Stuff Preparation and Physical Standards

George K. Spence presided over the Stuff Preparation Division in Room 151 on Wednesday morning when papers were presented as follows: Physical Standards for Pulp, by H. A. Rothchild; Stuff Preparation, by J. J. O'Connor; Retention of Filler in Paper, by George K. Spence.

Physical Standards for Pulp

In the report of the Committee on Physical Standards for Pulp, H. A. Rothchild, chairman, explained that the committee had only one project under consideration at present, and that was the working out of a method for evaluating pulp in respect to its papermaking property. A method for initial strength testing of pulp had been developed and proposed for adoption two years ago, but the general adoption of the method was made difficult on account of the character of testing equipment in the various mills. The committee had accordingly occupied itself in an effort to find a relationship between the principal methods now used for testing pulp. Three samples of bleached sulphite pulp having three different values so far as papermaking properties are concerned had been sent to each member of the committee for testing and evaluation, an abstract of the results being given in the report, together with a relative evaluation of the pulp based on the tests. These showed

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some remarkable variations. Regardless of method of testing all of the chemists graded the three pulps, A, B, and C as 1st, 2d, and 3d, respectively. (A) was a fairly good bleached balsam pulp, (B) a fairly good bleached hemlock, and (C) a bleached hemlock taken from a batch which had been ruined in a bleaching process.

The report stated that one of the problems suggested for T. A. P. P. I. the year it was organized was to work out a method for evaluating pulp for papermaking. Since then various methods have been proposed, until now nearly every mill has a method of its own. Experience in meetings had shown that each member considered his method better than any other method and he was unwilling to change. To this impasse had come the efforts of the committee to adopt a standard method when the comparative testing of pulps (A), (B) and (C) apparently show the way out. As various mills using various methods obtain the same comparative valuation on given pulps, why not follow up this lead to bring all the mills together on evaluation of pulp for papermaking, regardless of methods of testing. This the committee decided to do at the last meeting in Wausau. The method to be employed was stated as follows:

"A lot of a standard pulp is to be chosen and a sample of this pulp sent to each co-operating mill. This standard pulp will be given an arbitrary valuation of 100. Then any unknown pulp would be tested by the method peculiar to the individual mill, and the standard pulp tested by the same method and a valuation given the unknown pulp accordingly. For example, if the mill tested the standard pulp as 48 and the unknown pulp as 43, then the valuation of the unknown pulp would be $\frac{43}{48}$ x 100 or 89.6. Likewise, another mill by its own pet testing method would presumably get a test of 180 on the standard pulp and 160 on the unknown pulp and its valuation of the unknown would be $\frac{160}{180}$ x 100 or 89.6 also. In this way various mills with various testing methods could express the valuation of a pulp in common terms intelligible to each other.

"This standard pulp together with a number of samples of unknown pulps will be sent to committee members in the near future, and if results prove as anticipated, a recommendation will be made to the Technical Association."

Retention of Filler in Paper

In the paper bearing this title, which was presented to the Stuff Preparation Committee by G. K. Spence, chairman, a number of retention tests were reported. Details were given of methods of determining the retention of clay used in the beater. This called for data on (1) moisture, fiber and clay content of the finished sheet; (2) fiber and clay content of the sheet passing from the wire to the first press—dry basis; (3) fiber and clay content of the stock in the water leaving the first press—dry basis; (4) fiber and clay content of the stock in white water from the wire—dry basis; (5) fiber and clay content of stock in the head box—dry basis; (6) fiber and clay content of stock in machine chest—dry basis; (7) combined water content of clay used and natural ash in the fiber mix.

Calculations were appended.

Stuff Preparation

The paper on "Stuff Preparation" by J. J. O'Connor counseled careful individual study of the raw material of the stuff used in the furnish. Procedures have been developed and equipment have been standardized to measure the quality of the materials used in the manufacture of paper and the application or use of these measures and equipment must be adapted to the specific problem of each paper mill.

Mr. O'Connor gave a tabulation of the results obtained by one manufacturer who had made a study of pulps with a standard Mullen tester, a standard Elmendorf tester and standard freeness tester. This manufacturer had measured with these instruments the quality of his own pulp as well as that of the pulps of competitors and the study and analysis involved had been productive of valuable information.

The importance of knowing the quality of raw material before attempting to standardize or control the furnish was emphasized. With accurate knowledge and information of this kind and correlative information between laboratory results and mill practice, it was not even then a simple matter to compensate for inherent variations in furnish constituents. Two courses were open with a view to insuring greater uniformity of product. One was to work with the raw material producer and get him to regulate his operation and the other was to compensate for differences by varying the proportion of individual constituents. While the lastnamed was a dangerous practice unless all important facts were known, one plant had carried it out for a year or two with excellent results, Mr. O'Connor said.

The paper made a plea for more science and less art in the preparation of stuff. Stuff mysteries of yesterday were the scientific and simple facts of today.

Tests for Papermaking Materials

In the Materials Testing Division which met on Wednesday afternoon, Dr. Jessie E. Minor, chairman, papers were read as follows: Pulp Pitch Analysis, by R. C. Griffin; Salt Cake Analysis, by F. J. Curtis; China Clay Analysis, by D. D. Uong; The Moisture Content of English Coating Clays, by R. M. Cobb and D. V. Lowe; Rosin Size Analysis, by E. Frank Whittington; Hypochlorite Bleaching Materials, by W. L. Savell.

Determination of Pitch in Woodpulp

Roger C. Griffin's paper on "A Proposed Method for Quantitative Determination of Pitch in Woodpulp" gave detailed instructions for the preparation of the sample. The pulp should be separated into thin layers and dried, the layers being then cut into pieces about 2 x 4 in. and 5 grams weighed out for each extracted in a Soxhlet apparatus with sulphuric ether. The ether solutions are filtered through cotton and collected in a weighed Soxhlet flask. The solution is then evaporated and the residue dried to constant weight. The weight of the residue is calculated to percentage of the air-dry pulp and reported as ether-soluble pitch.

Another extraction is made after completion of the ether extraction with neutral ethyl alcohol, the alcohol solution being evaporated and weighed in the same way as the ether extraction.

The total pitch is reported as the sum of the percentages of the ether-soluble pitch and the alcohol-soluble pitch insoluble in ether.

It was noted that in the case of sulphite pulp a separate portion of the prepared sample can be extracted directly with alcohol to obtain the total pitch. E. Richter called attention a number of years ago to the fact that the pitch in sulphite pulp is completely soluble in alcohol.

Salt Cake Analysis

Mr. Curtis's paper constituted an outline method of testing salt cake with a view of establishing a standard of purity for the substance. This paper does not lend itself to abstracting but it may be noted that the suggested standard placed a limit of 2.3 of sulphuric acid, 1.0 of sodium chloride, 1.6 of iron, alum, calcium and magnesium as sulphates, leaving 95.1 of absolute sodium sulphate. Methods of testing insoluble material, free acid and other impurities of salt cake were given in addition to a method for estimating total sulphate.

China Clay Testing

The characteristics of the clays and fillers used in paper manufacture were described in the paper by G. D. Uong at the meeting of the Materials Testing Committee. Clay was stated to be a hydrated aluminum silicate; talc a hydrated magnesium silicate, and agalite or asbestos a fibrous magnesium silicate. Tests were recommended as applicable to clay, talc, and agalite. Methods of sampling were given followed by details of procedure. Before comparing the color of clays they should be dried at 105° Cent. Differences in color can be observed by comparing the clays under examination with a standard clay. A small amount of the standard clay and a like quantity of the sample in question should be placed on a sheet of black paper and both clays pressed with a polished stainless spatula to make

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a smooth surface. Placed side by side any difference in color can easily be seen.

The detection of artificial coloring was described as follows:

"In one of two similar white porcelain dishes, place a measured amount of freshly prepared saturated lime water and in the other an equal volume of distilled water. To each dish add equal amounts of the clay in question by dusting a little at a time from the end of the spatula, let stand a few minutes, siphon off the excess liquid, and compare colors of the moist clay in the two dishes. If the clay has been blued the lime water removes the blueing, and the color of the portion of clay which has been treated with lime water is quite different from the color of the portion treated with distilled water. When the clay contains no artificial color, the color of the residues in the two dishes is the same."

Other tests included the disintegration test, by which a few lumps of clay are allowed to stand in water without agitation. A good clay disintegrates quickly and on stirring yields a smooth, homogenous cream. Grit is detected by the sift test and by the elutriation test described in Vol. IV of **The Manufacture of Pulp and Paper.** Adulterants and their detection were mentioned briefly and a method of diagnosing the presence of iron was given. Microscopic examination and centrifugal tests were mentioned as important supporting methods for determining fineness. The detailed procedure for fineness is to weigh one gram of clay filter into a 100 cc. beaker containing 25 cc. of water at 80° Fahr. The mixture after being thoroughly disintegrated is transferred to a 50 cc. Nessler tube, the tube being filled to the mark with water. With thumb over the opening, the tube is shaken vigorously and then allowed to stand vertically in a quiet place for 15 minutes, at the end of which period, the height of the settled column of filler is taken in millimeters. The higher the column the finer the filler.

The colloidal property of a clay can be determined by inserting a metric measuring stick bearing a ring of platinum wire of 0.023 in. diameter into the filler mixture in the Nessler tube, immediately following the fineness test. The diameter of the ring should be 8 millimeters. The measuring stick should be lowered gradually until the platinum ring is out of sight, viewing from top of the tube. Take the reading in millimeters. The colloidal property is inversely proportional to the number of millimeters.

Analysis of Rosin Size

A method used in the laboratory of the Sutherland Paper Company, Kalamazoo, Mich., for the analysis of rosin size was described by Mr. Whittington. Although still in the experimental stage, the method appears to be quite accurate. The use of a platinum dish for alkali determination is obviated by the proposed method, as well as the inaccuracy resulting from the use of porcelain, which is liable to become fused with the alkali.

Detailed instructions for sampling and treating any rosin sizing compound were given. The principle followed was based on the assumption that the amount of acid necessary to liberate the combined rosin is directly proportional to the amount of alkali combined with the rosin, the amount of total alkali present being figured from the net amount of tenth-normal sulphuric acid used, with 1 cc. of acid equalling 0.0031 Gm. sodium oxide and 0.0053 of sodium carbonate.

Bleach Analysis

The paper entitled "Analysis of Hypochlorite Bleaching Materials", by W. L. Savell embodied a series of test methods for determining the chlorine content of bleaching powder and bleach liquor. Mention was made of an automatic device for approximate determinations known as the Mathieson bleach tester. This equipment is made and marketed by Eimer and Amend, 203 Third avenue, New York.

Sulphite Pulp Manufacture

There was a good audience in the Myrtle Room on Wednesday afternoon to hear the papers presented in the Sulphite Pulp Division, of which R. N. Miller is chairman. A valuable account of the origin and development of the sulphite pulp industry was presented in a paper by T. L. Dunbar, manager of the Canadian Stebbins Engineering and Manufacturing Company, in which was reproduced in full the claims of Tilghman's first patent involving the use of sulphurous acid in reducing wood to pulp. The progress of the industry, following the introduction of the Mitscherlich process and the development of the Ritter and Kellner process, were interestingly summarized.

Waste in Sulphite Work—Mention was made of the waste that is apparently inseparably connected with sulphite pulp manufacture. "The sulphite mill has become the greatest waster in industrial history. It throws away more than half of the raw products put into the process and dissipates about 70 per cent of the heat used, nearly all of which can be recovered. Chemists tell us that the average sulphite mill rejects to the sewer products which are more valuable than the pulp produced."

Improvements—Mr. Dunbar discussed methods of filling the digester and circulation of cooking liquor and said that improvements and modern processes had served to mark real advances in manufacture, other creditable strides toward the goal of protection being recovery methods for hot liquor and gas. The title of his paper was "Sixty Years Operating Advancement in the Sulphite Industry". These sixty years of plodding progress and the knowledge they have given should, Mr. Dunbar said, provide a stepping stone to great future developments. Mr. Dunbar said he could visualize a supersulphite mill of the near future which would outstrip all other branches of the paper industry in scientific control and operation and fulfill the prophecy of Steinmetz that the sulphite mill of the future would be the nucleous of numerous industries, powerful and important, second only to the vast industry of the coal tar products. (Note by Editor: It may be of interest to our readers to know that the text of Dr. Charles P. Steinmetz's address before the Technical Association, February 4, 1919, is published in full in the early organ of the association called "Paper", for February 12, 1919, p. 248, index folio 848).

Sulphite Digester Operation

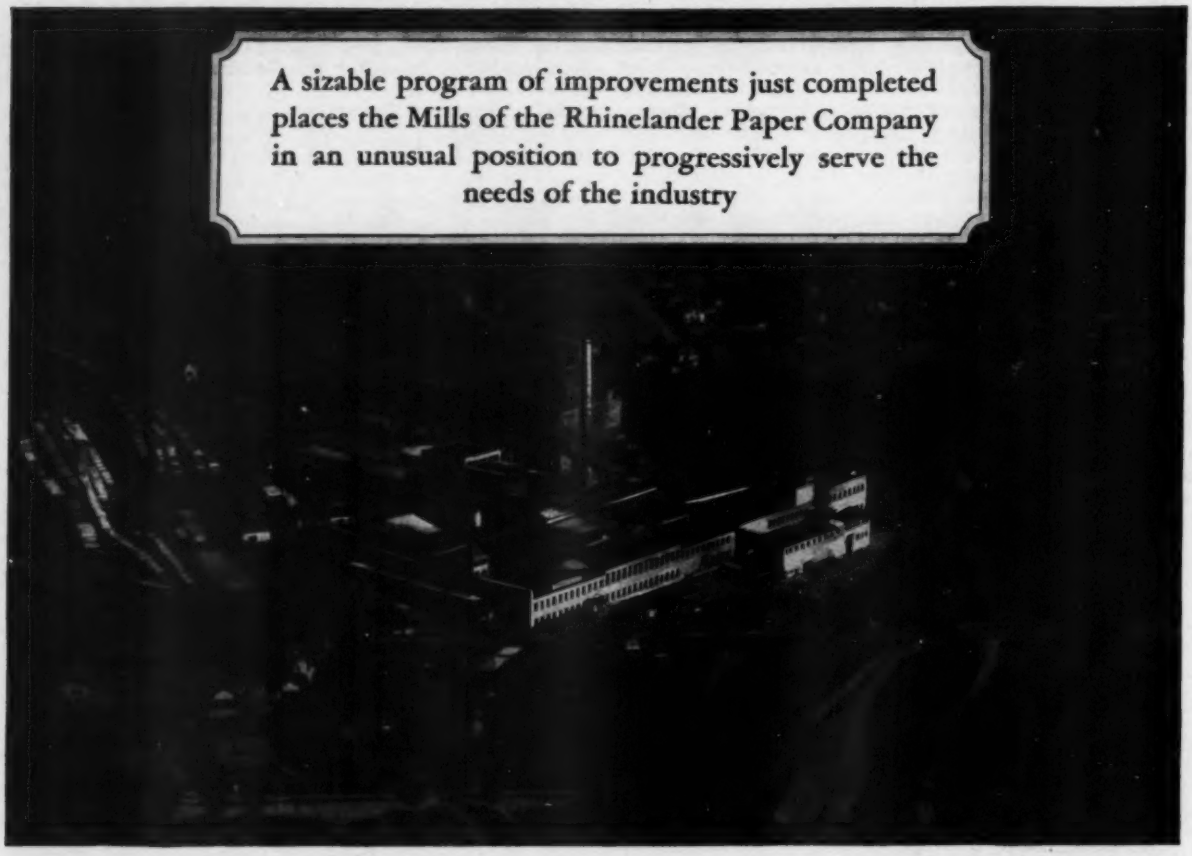
At the sectional meeting of the Sulphite Pulp Committee, under the chairmanship of R. N. Miller, F. Hayward Johnson, Jr., of the Cherry River Paper Company, reviewed developments in the sulphite cooking process. The study of actual cooking had made some progress, results having been tabulated, operations checked and men educated to better knowledge of their particular work. Speaking of the standard method of injecting steam into the sulphite digester through a single steam inlet in the bottom fitting of the digester, Mr. Johnson said there was danger of the bottom part of the digester charge becoming heated to a point where the acid would be decomposed and some of the chips so affected as to make them fit only for screenings. In his view, high "superheat" was responsible for more low yield and high proportion screenings than was generally understood. Improved circulation in a digester is effected by introducing steam in several places halfway up the bottom cone as well as in the bottom fitting.

Mr. Johnson described the method of cooking followed at the mill of the Cherry River Paper Company. By using steam nozzles with a rate of 13,000 to 13,500 lb. of steam per hour, a temperature of 110° Cent. can be reached in about two and a half hours. After reaching this temperature point, the digester is relieved from the top relief line of 5¾ to 6 hours. The relief is then changed to the side of the digester and continued for 7¾ or eight hours, when the side relief is closed and relieving resumed from the top of the digester. Relief should not be too fast, else the temperature will rise and cause decomposition of the cooking acid. To counteract any tendency to a burned cook the digesters are relieved very slowly after first "coming on gas".

Side Relief—It was noted by Mr. Johnson that many men otherwise well versed in the sulphite cooking process do not favor the use of a side relief connection and he enumerated the points in its favor. Side relief permits the SO_2 gas, driven off at high temperatures, to accumulate in the top of the digester until the operator begins relieving from the top relief line.

The advantages of reducing digester pressure at the close

A sizable program of improvements just completed places the Mills of the Rhinelander Paper Company in an unusual position to progressively serve the needs of the industry



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of the cook were set forth. The actual building up of a suitable cooking acid, free from SO_3 and having a strength of 6 per cent can be accomplished best by proper relieving of the digester.

Control work was favored. Money spent in control work and recording instruments was money well invested. Tests of the system and cooking acid should be made regularly by the operators and the results checked by laboratory work. Strength tests, bleachabilities, freeness tests and dirt count should be made on each digester of pulp produced.

Training for the Industry Division

H. G. Noyes presided at the meeting of the Committee on Training for the Industry, which met in Room 151 at 2 o'clock on Wednesday afternoon. The program called for a paper by Allen Abrams and another by Mr. Noyes, while J. Norman Spawn was to submit a report as chairman of the Joint Committee on Vocational Education.

The Tappi Training Program

The account by Allen Abrams, of "The Present Status of the Tappi Training Program" indicated that the plan of placing young men in mills during the summer months to get a practical knowledge of pulp and paper manufacturing operations was working admirably. During the past summer upwards of 100 men representing about thirty schools were found places in forty mills. These men engaged in all types of work, such as drafting, construction, paper machine operation, forestry assistant, and electrician's helper, at rates varying from 35c to 50c an hour.

Mr. Abrams has resigned as chairman of the Tappi Committee on Training for the Industry, effective January 1, 1929 and has been succeeded by H. G. Noyes.

Future Outlook for Training Program

Harold G. Noyes, acting chairman of the Committee on Training for the Industry, supplemented the report by Allen Abrams with the description of a proposed survey of the mills to ascertain if (1) the company would participate in the training program by placing one or more university or college students during the summer months; (2) types of jobs on which such students would be placed; (3) rate of pay for students; (4) date when students might start work.

Simultaneously with the foregoing questionnaire it was recommended to establish contact with some person in authority in the co-operating college or university to ascertain the following particulars:

(1) Number of students interested in a summer job in pulp and paper mill.

(2) Localities where such students prefer to work.

(3) Rate of pay desired.

(4) Likelihood of students entering the industry permanently upon graduation.

In order to obtain co-ordination of effort on the part of those affected by the plan, it was suggested that personal visits be made to mills and interviews obtained with heads of college departments.

A summary of Mr. Spawn's report as chairman of the Joint Educational Committee is given in the proceedings of the general meeting of the American Paper and Pulp Association, on another page in this issue of THE PAPER INDUSTRY.

THURSDAY MORNING

Divisional meetings were held on Thursday, February 21, of the Paper Testing Committee, Soda and Sulphate Pulp Committees and the Groundwood Committee from 9:30 A. M. till noon, and at 1:45 there was a general meeting in the Myrtle Room for the election of officers and transaction of unfinished business.

Paper Testing Committee

After calling the meeting to order, B. W. Scribner, chairman, reviewed the development work in progress by subcommittees. He reported that E. O. Reed had arranged for co-operative tests by a number of laboratories to improve the technic of ink resistance of printing papers and to find the degree of agreement among the different laboratories, while C. E. Libby had given attention to the use of the dot method for counting fibers in paper composition determination. Miss Helen U. Kiely had conducted a number of investigations, including a revision of the method for quantitative determination of paraffin to include separation from resin. A quantitative separation of paraffin can be obtained by using carbon tetrachloride as the extracting medium. It was found that Benedict's solution, which was proposed by Genberg, is superior to Fehling's solution for determining starch as it is somewhat more rapid and the end point is more definite; but as both solutions give equally satisfactory results the use of Benedict's solution will be proposed as an alternative method. Reference was made to other development projects, and a list was given of the important articles dealing with paper testing which had been published during the year.

Mr. Scribner said that intensive study was needed to develop the necessary fundamental knowledge of paper as related to its testing.

Sizing and Greaseproof Tests

The report of the Paper Testing Subcommittee on determination of permeability to liquids was submitted by Allen Abrams, chairman, at the meeting of the Paper Testing Committee. The subcommittee had made it its endeavor to work towards standardization of sizing tests for paper and for a satisfactory greaseproof test. The curl test and the dry indicator test as used by the Bureau of Standards in measuring internal sizing were employed with a view of establishing which of the two offered the more satisfactory procedure. Four samples of paper were selected for the tests and sheets were sent to co-operating members with a request that they make five tests on each sample using both the curl test and the dry indicator test, the Carson curl sizing tester being used for the one and the Penescope for the other. Where these instruments were not available, flotation methods were to be used. Details of the methods employed were given in all cases. It was stated that the results obtained by the dry indicator (Penescope) test and by the curl flotation test were about equally consistent, but that the Carson curl sizing tester appeared to give more uniform results.

In the study of a method for measuring greaseproofness, various samples of parchment and bleached and unbleached greaseproof papers were used. Two methods of testing grease resistance were employed, the iron pipe method and the Penescope method.

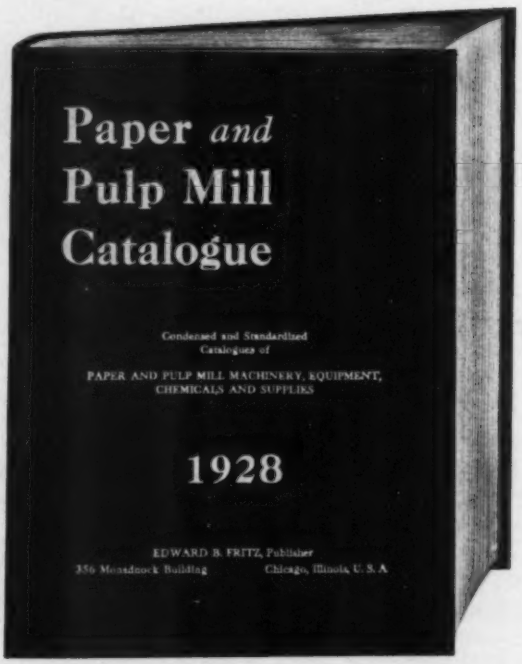
Some interesting comments by laboratories to which specimens of papers have been sent for examination were appended. Turpentine is generally used as a test, but oleic acid is preferred by at least one government laboratory and the necessity for adopting a standard testing liquid was impressed on the committee. The conclusions of the committee were that results on greaseproof tests indicated a very wide difference in data obtained on the same paper by identical methods. The work will be continued.

Testing Methods for Roofing Felt

The relations of tests adopted by the Prepared Roofing Association and tests published in "Paper Testing Methods" or presented recently by the Roofing Felt Committee were discussed by Mr. Codwise, who is chairman of that committee. He gave particulars of the sampling methods employed and tabulated the results of certain tests. Methods of figuring the basic and air-dry weights of felts were given and the determination of moisture and thickness received consideration. Strength testing including the bursting strength, tensile breaking strength and tearing strength, though the last named is not in general mill use. It was noted that the strains to which a felt is subjected upon the saturating machine are of varied character. There is no constant relation between bursting strength and tensile strength with the grain of the felt, and on this account it was desirable to specify both the tensile and the Mullen test results. Results were given of tests for tearing strength made with the regular Elmendorf tester and with the modified form. The average results obtained with the two machines checked quite well, though there was some deviation in individual readings. The ash in roofing felt should not exceed 10 per cent.

PAPER AND PULP MILL CATALOGUE

Published Annually in June



The one complete reference book for paper and pulp mill men when they are looking for information as to the source for buying any type of equipment or supplies for their mill.

The Contents of the Last Issue

Index of Equipment and Materials (Other than Chemicals) Used by Paper and Pulp Manufacturers

Index of Chemicals and Dyestuffs Used by Paper and Pulp Manufacturers

Index of Books on Paper Making and Allied Subjects

Directory of Institutions Teaching Pulp and Paper Manufacture

Directory of Traveling Representatives for Machinery and Supply Houses

Index to Volume Nine of The Paper Industry

Useful Information for Pulp and Paper Manufacturers

Mill Equipment Section

Power Section

Chemical and Raw Material Section.

This book is not a directory or list of mills, jobbers, etc., but a catalogue of equipment for the mills. Mill men must pay for a directory if wanted, while the Catalogue is free to them and to everyone who has the buying or suggesting power in these mills. This is only one type of service that the publisher of The Paper Industry furnishes free to paper and pulp manufacturers and their men—for which we ask no remuneration.

The section—Useful Information for Pulp and Paper Manufacturers, is of extreme helpfulness to important production men and should be studied. In the next issue this will be greatly enlarged.

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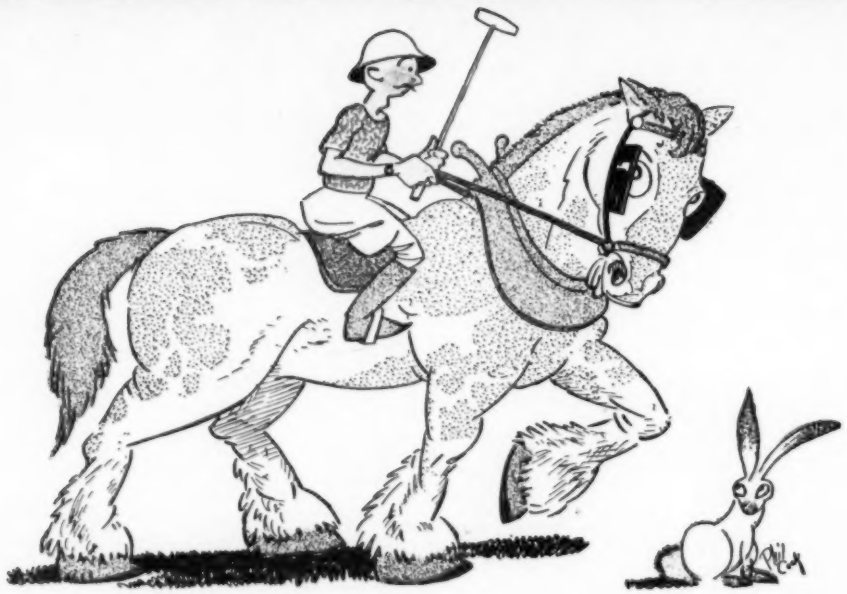

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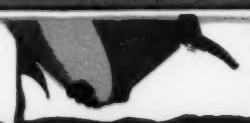

Activities of Roofing Felt and Paperboard Committee

The committee on roofing felt and paperboard submitted data bearing on the relations of different tests for roofing felt. In felt mill operation, continuous beater systems have been used in the interest of economy and chlorine has been applied to the stock with the object of preventing slime formation. For the purpose of reducing shrinkage losses the reuse of white water through closed systems has been advocated.

The saturating characteristics of roofing felt through a determination of the porosity of the sheet by means of the Gurley densometer has been suggested as a subject for further investigation.

Some work had been done by the committee with the Elmendorf tearing tester with a view of determining more accurately the tearing resistance of various roofing felts. An enumeration of papers that have been published was included in the report.

A great variety of materials is often to be found in a given sample of felt. Mr. Codwise instanced wool (colored and uncolored); silk, rayon, cotton, linen, jute, chemical pulp, mechanical pulp and various straws. It was important to know the saturating characteristics of felt. In saturating, a continuous sheet is passed through a bath of heated asphalt (400° Fahr.). The felt must pass through the bath quickly, the time of immersion being measured in seconds. It was important that there should be rapid and efficient saturation and that the sheet should hold the proper amount of saturant. The saturating capacity is usually determined by estimating the amount of kerosene which the felt will take up. The figures with kerosene are usually higher than the actual per cent of saturation obtained in practice with asphalt. An oil penetration test is also used, a sample of felt being floated upon the surface of a bath of light mineral oil and determining the time required for absorption. The capillarity of felt toward xylol is also used for determining the rate of saturation of a felt. The result is reported as the number of seconds required for the solvent to rise a definite height of 3 cm. above the surface of the xylol.

Mr. Codwise said the report was presented with a view of stimulating work in the establishment of correct test procedures for evaluating roofing felt.

Soda Pulp Division

Among the papers presented at the meeting of the Soda Pulp Committee, of which Joseph E. Plumstead is chairman, in room 151, on Thursday morning, was one listed on the program as "The Keebra Process by Linn Bradley". This was a joint production of Mr. Bradley and his associate, Edward P. McKeefe.

The Keebra Process

The paper by Linn Bradley and Edward P. McKeefe describing the manufacture of chemical pulp with the aid of a digesting liquor containing sodium monosulphite as its chief constituent, was read by Mr. Bradley. When the digesting liquor contains a chemical, other than sodium monosulphite, of such character and in sufficient amount as to modify the action of the sodium monosulphite, the process is referred to as a modified Keebra process. Some of the modifications of the cooking liquor are known variously as acid Keebra, thiokeebra, sulphokeebra, semikeebra and carbokeebra. The acid keebra contains both sodium monosulphite and sodium bisulphite, the variations being regulated to suit particular operations. There term thiokeebra is applied to a digesting liquor that contains a preponderating quantity of sodium monosulphite and a lesser but substantial amount of sodium thiosulphate. In the same way sulphokeebra is the term sometimes applied to digesting liquors containing a preponderance of sodium monosulphite and a lesser amount of sodium sulphide. Semikeebra designates a process in which the digesting liquor contains a larger amount of sodium hydroxide than of sodium sulphide, together with a substantial amount of sodium sulphite. Sodium carbonate added to a digesting liquor containing sodium monosulphite forms a carbokeebra process. Other bases instead of soda may be used, potassium monosulphite for example. Sodium is more readily obtained in North America than potassium, hence it is more feasible to employ it.

Particulars were given of the behavior of the different digesting liquors with coniferous and deciduous woods. Each class of wood requires different treatment in the initial heating stages of digesting. It was explained that when coniferous woods are digested with the sulphokeebra process or with the semikeebra process liquors, the heating in the initial stages may be at a relatively rapid rate if desired. These types of liquors appear to penetrate the wood substance more rapidly than the other keebra liquors. With liquors containing little if any active digesting reagent, other than a soluble monosulphite, coniferous woods are best progressively heated at a moderately slow rate until the particles of wood have become adequately impregnated, after which they may be heated at a faster rate until a temperature has been reached at which digestion can be completed.

Deciduous woods as a class are more readily penetrated by the keebra liquors than coniferous woods. It was noted that wood chips may be subjected to a partial digesting treatment by means of the keebra, acid keebra, thiokeebra or carbokeebra processes under mild conditions regulated so as to render soluble a major portion of the nonfibrous matter without dissolving an excessive amount of the cellulose, and the fibrous material may be thereafter subjected to a mild digesting treatment with a more alkaline liquor under conditions regulated to dissolve substantially all of the remaining nonfibrous organic matter.

The proportions of salts contained in the variously named digesting liquors were shown in a tabular arrangement. Thus keebra was represented to contain 160 grams of sodium monosulphite in a liter of water; acid keebra contained 60 grams of monosulphite and 80 grams of sodium bisulphite; thiokeebra was represented to contain 150 grams of sodium monosulphite and 15 grams of sodium thiosulphite; sulphokeebra has 120 grams of sodium monosulphite, 40 grams of sodium sulphide, 10 grams of sodium hydroxide and 5 grams of sodium carbonate to the liter; semikeebra has 35 grams of sodium monosulphite, 10 grams of sodium sulphide, 50 grams of sodium hydroxide, and 8 grams of sodium carbonate in a liter, while carbokeebra was represented by 140 grams of sodium monosulphite, 5-grams of sodium thiosulphate, 10 grams of sodium carbonate and 5 grams of sodium bicarbonate to the liter.

The operating procedure was indicated, directions being given for the cooking of spruce wood. Conditions were described as generally applicable to coniferous woods generally. The preparation of the liquors was said to be not difficult. For example, a solution of sodium sulphite or sodium bisulphite, or a regulated mixture of sodium monosulphite and sodium bisulphite could be prepared by burning sulphur to form sulphur dioxide and by passing this into a solution of sodium carbonate until the desired quantiy of SO_2 has been combined. The details of manipulation for certain basic chemical salts to form other compounds were presented in brief technical form which an operator unaccustomed to making chemical solutions by the introduction of gases and chemical solutions with other solutions might find it difficult to follow. Recovery methods were also indicated by processes familiar to chemists skilled in the manufacture of digesting liquors of the kind described.

Hardwoods and short-fibered woods can be pulped by the semikeebra or the keebra process, and admixture of these with spruce, balsam or pine pulps have been used in the manufacture of writing paper as well as book and magazine paper.

The keebra process was operated commercially for the first time at the mills of the Ticonderoga Pulp and Paper Company, Ticonderoga, N. Y. The Northwest Paper Company at Cloquet, Minn., has produced large amounts of pulps by the keebra process from jackpine, tamarack, aspen and birch and use the pulps in the production of a variety of papers. In Canada the Canada Paper Company makes a considerable tonnage of pulp and papers by some of the keebra processes, while the Laurentide Company at Grande Mère, P. Q., used keebra pulp made from hardwoods in admixture with groundwood for the production of newsprint paper.

In bringing their paper to a close, the authors mentioned

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PAST performance wrote the specifications for SKF Ball Bearings on this large Nash vacuum pump which is operating the wet end in the new mill of the Grays Harbor Pulp & Paper Company, Hoquiam, Washington. Throughout the paper industry it is axiomatic that, although SKF Bearings may cost a trifle more, they soon pay for themselves in reliable operation, lower upkeep and freedom from shutdowns.

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it as an interesting coincidence that at about the same time they were developing the keebra process, Dr. Viggo Drewsen, of the research staff of the West Virginia Pulp and Paper Company, was engaged in an independent investigation of the use of sodium monosulphite solution as a pulping agent for wood. Dr. Drewsen considers that chemical pulps produced from woods by the sodium monosulphite digesting process have exceptional merit.

One of the interesting papers brought before the division was entitled "The Manufacture of Electrolytic Caustic Soda and Bleach by Pulp and Paper Manufacturers", by Joseph E. Plumstead.

Own Manufacturer of Soda and Bleach

Mr. Plumstead's argument for the production of caustic and bleach by the pulp and paper manufacturer as an economical procedure and a source of profit was backed by figures that were very convincing. He considered the case of a 75-ton soda pulp mill using 15 lb. of bleach for each 100 lb. of pulp. In such a case the bleach requirement would be 22,500 lb. a day and the caustic output in the manufacture of this amount of bleach 8,500 lb., equivalent to 11,400 lb. soda ash, represented an amount almost sufficient to supply the make-up soda requirements of the recovery department of the mill.

On this hypothetical case, Mr. Plumstead determined a bleach cost figure as follows:

Salt @ $8 a ton	26 per 100 lb. 35% bleach
Power @ $.008 per kwh. and coal for evaporation and heat @ $5 a ton	.51 per 100 lb. 35% bleach
Labor @ $40 a day	.18 per 100 lb. 35% bleach
Renewals and supplies @ $15 a day	.07 per 100 lb. 35% bleach
Fixed charges @ $40 a day	.18 per 100 lb. 35% bleach
Total	1.20 per 100 lb. 35% bleach
There will be about 0.38 lb. of 100% caustic soda @ $2.75 for each lb. of bleach or a credit of	1.02 per 100 lb. 35% bleach
Net cost of bleach	.18 per 100 lb. 35% bleach

which is equivalent to approximately half-cent chlorine.

Mr. Plumstead said that the gross costs enumerated would also hold for a sulphite mill providing the caustic could be sold. Where the caustic is not sold it could be employed in bleachmaking and credited at the cost of lime, or it could be used in the acid plant in the manufacture of a superior cooking acid.

He gave instances where some pulp and paper manufacturers had declined to consider the installation of a bleach plant for various reasons, without having a correct understanding of the savings to be effected.

Manufacture of Mechanical Pulp

The meeting of the Mechanical Pulp Division was held on Thursday morning under the chairmanship of W. E. Brawn, when papers were presented as follows: Comparison of Grinder Types, by Keith Gainer; The Relation of Pulp Stone Grit to the Quality of the Fiber, by L. S. Simons and B. Bornstein; Pulp Stone Grit in Mechanical Pulp, by Edwin A. Riley; Some Aspects of Freeness Testing, by D. S. Davis; Preventing and Utilizing Groundwood Rejections, by W. E. Brawn.

Comparative Costs With Mechanical Pulp Grinders

In a "Comparison of Grinder Types", W. Keith Gainer made a comparison of the three types of mechanical pulp grinders in general use on a pulp cost per ton basis. The advantages of one type of grinder as compared with others were shown by percentages. The costs per ton for various items as obtained from a record of chain-feed grinders was placed at 100 per cent. By giving the costs of grinding, wood handling, maintenance labor, maintenance materials, grindstones, burrs, lubricants, electric power, production per grinder and total cost per ton, inclusive and exclusive of wood preparing costs, with a Warren grinder using 4-foot wood, rated as 100 per cent, comparisons were made with a Voith grinder of the hydraulic magazine type, and with a pocket grinder. Maintenance labor was highest with the Voith grinder and grinding labor was highest with the pocket grinder, but pocket grinders expense for grindstones was very much lower than either the Warren grinder or the Voith grinder. Wood-handling labor is higher on the pocket grinders than either of the other types. Lubricant costs show up lower for magazine and pocket grinders than for the chain feed type or Warren grinder, caused chiefly by the different systems of bearing lubrication in use. Oil rings are used on the hydraulic magazine and a continuous circulating system on the chain feed. Mr. Gainer observed that the stock reduced with the pocket grinder was better and there was less waste than that produced by either the chain feed or magazine type. The comparative figures follow:

	Chain	Hydraulic Magazine	Pocket
Grinding labor	100	71.33	101.00
Wood-handling	100	75.00	125.00
Maintenance labor	100	200.00	128.50
Maintenance materials	100	88.80	94.40
Grindstones	100	66.60	20.40
Burrs	100	50.00	24.20
Lubricants	100	16.66	41.66
Electric power	100	96.44	114.25
Production per grinder	100	137.15	62.30
Total cost per ton	100	90.59	104.04
Total cost per ton exclusive of wood preparing cost	100	81.64	87.30

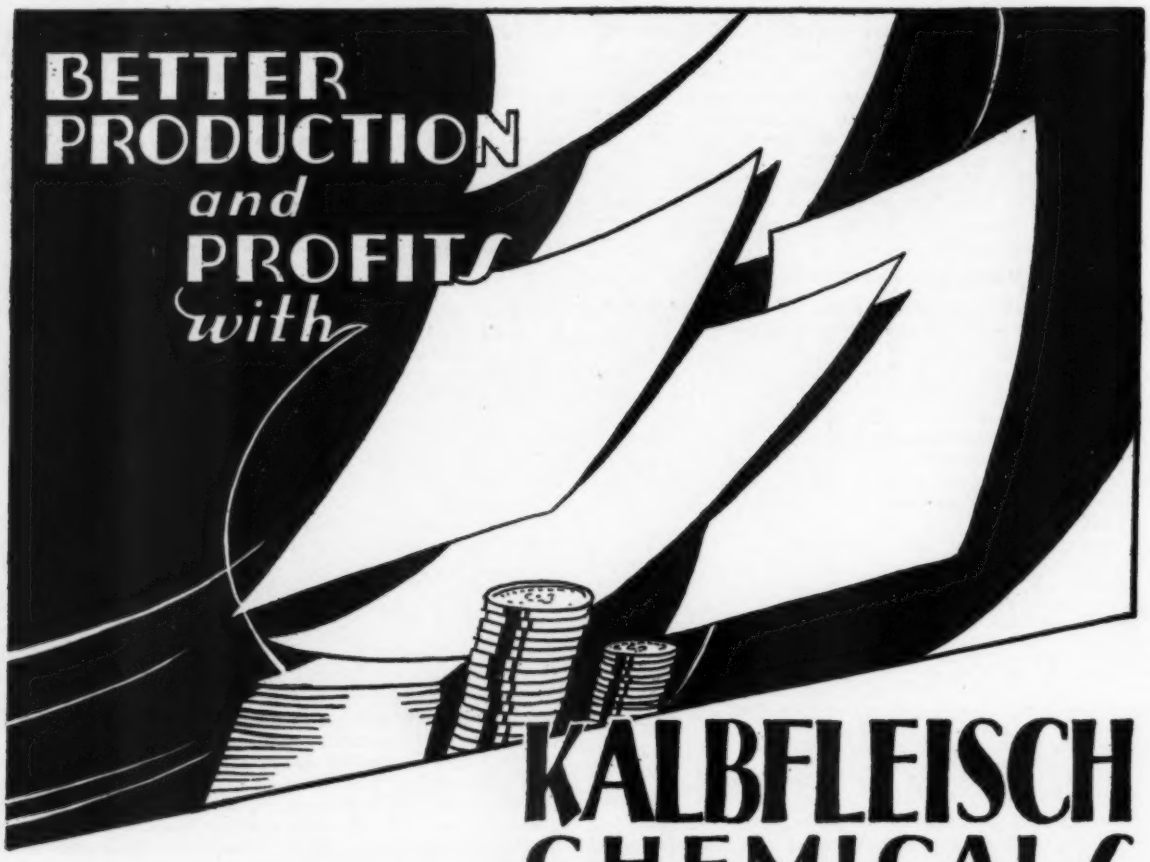
Pulpstone Grit and Quality of Fiber

The paper by Langdon S. Simons and Bernard Bornstein, of the Norton Company, Worcester, Mass., discussed the physical properties of pulpstone and their pulp producing characteristics, as modified by the use of burrs. Comparisons were made with native and English pulpstones and the vitrified abrasive grindstones of the Norton type, and the difference in structure discussed.

The authors make an attempt to clear up the confusion and misunderstandings that exist concerning the physical characteristic of pulpstones owing to the use of a loose nomenclature. The fineness and hardness of the stones are often confused with each other and with the density of the structure. Even the so-called fine stones contain a large proportion of coarse grit, sometimes equal to 50 per cent of the total and seem fine because of the dense nature of the structure. Hardness may be defined, the paper said, as the tenacity with which the bonding material holds the grits together. A hard stone resists abrasive or cutting particles under severe grinding pressure and a stone from which these cutting particles are easily broken away is called "soft". Density is represented by the weight of a certain volume of material. The degree of fineness is determined by a screen analysis and the authors gave details of the methods of preparing a sample.

It is the conclusion of the authors from experimentation with various grit sizes in the manufacture of artificial pulpstones that a good grade of pulp can be made from a large variety of pulpstones. While it is generally true especially in hydraulic grinders, that any quality of pulp can be made with even medium coarse stones by proper burring it will be at the expense of production and horsepower. A finer stone is more efficient. For example, the pattern on a fine vitrified abrasive stone is maintained longer without roughing out and becoming dull. With the same burr and under the same operating conditions, a coarse stone will produce a free stock with little flour and a fine stone will produce a slow stock with more flour. The pulp from a vitrified abrasive stone of the Norton type is more uniform in fiber length and has less flour than the pulp from a sandstone. It is desirable where freeness control is used to set a higher freeness figure as a standard for Norton stones.

The authors included in their paper a good deal of sound information concerning the handling of different kinds of pulpstone and the use of the burr. In the use of sandstones, it was pointed out that some operators go too far in varying the burr to suit different types of stone in use at the same time. Emphasis was placed on the fact that it is not so much the cut of the burr as the method of using it which governs both the quality and production. Burring variations could be corrected by having either a micrometer



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adjustment on the handle of the burr holder or a hydraulic pressure arrangement by which the stone could always be burred with the same degree of pressure. In conclusion the authors say:

"While there is a distinct relationship between the quality of fiber produced and the grit size of the stone, it is dependent upon the choice of the burr and even more upon the method of its use. In the case of sandstones, the best results can only be secured by analysis and selection of the proper stone for the type of pulp to be produced, together with the burrs that best work in with this. The two go together and must be worked out on this basis. With the Norton stone, it has been possible to work out grit combinations which work with the burr in obtaining the most efficient results. In both cases success is dependent on the method of use on variables that so far have been difficult of control. Methods must be worked out so that after the proper procedure has been determined it may be duplicated thereafter without change."

Grit in Mechaincal Pulp

The gritty substance given off by the grindstone during the grinding of wood and which finds its way into the finished pulp and causes trouble in the paper was treated in a paper submitted by Edwin A. Riley, of the Pejepscot Paper Company. It is comparatively easy to eliminate dirt caused by bark, shives, pitch, discolored fiber and trapped mud, as most of these can be kept back by careful operation in the process. As to grit this can be collected with a good riffler system. Care both in design and operation of the riffler is needed to get satisfactory results. Duplicate rifflers should be used in order to permit of one being cleaned while the other was in use. After a short time the riffler accumulates slime which causes the passage of additional dirt into the system. It has been suggested that means be taken to remove the grit at the time of burring the stone.

Freeness Testing

D. S. Davis reviewed his experience with freeness testing in the mill and laboratory with the Williams tester (Model B). He described the three types of freeness testers which had been the subject of papers by him in **Industrial and Engineering Chemistry** and the **Pulp and Paper Magazine of Canada.** The effect of certain variables as temperature and fillers upon the freeness of stock was set forth in tabular form.

Refining Groundwood Tailings

W. E. Brawn's paper had to do with the general subject of groundwood rejections. Descriptions were given of roller mills, rod mills and refining stones for the treatment of groundwood rejections. It was mentioned that several new types of refiners are now on the market which are improvements over older types and these should be investigated by mills with a view of using them for their particular requirements.

As the loss of material in the groundwood process ranges between 5 and 15 per cent of the weight of wood used, it was important for any mill to study its groundwood tailings and waste. The results obtained in an 80-ton groundwood mill, where careful control of operations was observed, were cited by Mr. Brawn. This mill, making groundwood pulp for standard and special grades of newsprint, was equipped with sixteen 3-pocket old-style hand-fed grinders for 2-ft. wood, water wheel driven, two grinders per line, oscillating type of bull screen with half-inch holes in the plates; three knotters having quarter-inch perforated plates; five centrifugal screens having 60/1,000 perforated plates and two tailing screens having tenth-inch perforated plates. With this equipment under continuous testing in a laboratory located in the grinder room, the average for the past year of each kind of rejection was: bull screenings, 10 pounds per cord; knotter rejections, 24 pounds per cord; tailings, 102 pounds per cord, or a total waste of 136 air-dry pounds per cord of wood ground. The average yield of No. 1 groundwood was 2,205 air-dry pounds per racked cord of 128 cubic feet of mixed drum barked and peeled wood.

Meeting Adjourned

The sessions of the annual meeting of the Technical Association came to a close with the General Meeting held in the Myrtle Room at 2 o'clock on Thursday afternoon, when officers were elected to serve during the ensuing year, as reported under Divisional Meetings earlier in this account of the proceedings.

Annual Banquet of Tappi

Retiring President Tucker acted as toastmaster at the annual banquet of Tappi held at the Hotel Commodore on Wednesday evening, February 20, and introduced the speakers felicitously with witty stories. The speakers were Howard C. Parmelee, editorial director of McGraw Hill Publishing Company and Gill Robb Wilson, past national chaplain of the American Legion. Dancing was enjoyed throughout the evening. As Toastmaster Tucker said, it was a "Semi-dinner dance banquet". Nearly 200 were in attendance

President's Annual Luncheon

One of the interesting and enjoyable features of the social program at the annual convention of the American Paper and Pulp Association in New York was the luncheon in honor of D. Clark Everest, president of the association, which was given between the forenoon and afternoon sessions of the general meeting of the A. P. and P. A. on Thursday, February 21, in the Waldorf-Astoria Hotel. It was an invitation event and was attended by a group of notables in the paper industry, including officers of the association, past presidents of the A. P. and P. A., and presidents and officers of affiliated and allied associations.

Those present were:

D. C. Everest, Marathon Paper Mills Company, Rothschild, Wis.

S. L. Willson, American Writing Paper Company, Holyoke, Mass.

Felix Pagenstecher, Bryant Paper Company, Kalamazoo, Mich.

J. P. Hummel, Hummel-Ross Fibre Corporation, Hopewell, Va.

W. L. Carter, Nashua Gummed & Coated Paper Company, Nashua, N. H.

Norman W. Wilson, Hammermill Paper Company, Erie, Pa.

Henry W. Stokes, York Haven Paper Company, Philadelphia.

Walter J. Raybold, B. D. Rising Paper Company, Housatonic, Mass.

George W. Sisson, Jr., Racquette River Paper Company, Potsdam, N. Y.

Arthur B. Daniels, L. L. Brown Paper Company, Adams, Mass.

Benjamin T. Larrabee, S. D. Warren Company, Cumberland Mills, Me.

R. B. Donnelley, Central Waxed Paper Company, Chicago, Ill.

Donald Lowe, Lowe Paper Company, Ridgefield, N. J.

Irving McHenry, Mid-States Gummed Paper Company, Chicago, Ill.

E. H. Naylor, Writing Paper Manufacturers' Association, Springfield, Mass.

James H. Coy, Flambeau Paper Company, Chicago, Ill.

E. C. Tucker, Chemical Paper Manufacturing Company, Holyoke, Mass.

W. H. Savery, Shenandoah Pulp Company, Harpers Ferry, W. Va.

Langdon B. Wood, M. H. Birge & Sons, Buffalo, N. Y.

D. K. Brown, Neenah Paper Company, Neenah, Wis.

W. N. Wilkinson, Supply and Equipment Section, Inc., American Paper and Pulp Association, New York City.

W. Noble Gillett, Chicago Paper Company, Chicago, Ill.

Kit S. Warner, John F. Sarle, Inc., New York City.

E. B. Allen, Adams Bag Company, Chagrin Falls, O.

Samuel C. Knode, Albemarle Paper Manufacturing Company, New York City.

H. W. Mathewson, Paper Supply Company, Minneapolis, Minn.

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J. M. Ward, Detroit Sulphite Pulp and Paper Company, Detroit, Mich.

E. W. Kiefer, Port Huron Sulphite and Paper Company, Port Huron, Mich.

George H. Gardner, Menasha Products Company, Chicago, Ill.

Cost Accountants Hold Meeting

International Fixed Calendar Endorsed at Semi-Annual Meeting of Cost Association

THE twenty-second semi-annual meeting of the Cost Association of the Paper Industry, held in Room 115 of the Waldorf-Astoria Hotel, on Tuesday and Wednesday, February 19 and 20, with forenoon and afternoon sessions, was well attended and proved very interesting. The meeting was opened by President Breck Aspinwall, of the Oxford Miami Paper Company, who delivered a brief address of welcome.

Advocates a 13-Month Year

After President Aspinwall's welcome the meeting got under way immediately, when Seth L. Bush, manager of the Research Department of the Crocker McElwain Company, Holyoke, Mass., was introduced and spoke on "The International Fixed Calendar—What It Is and Why We Want It". Mr. Bush told of the movement to establish by international consent a fixed calendar of thirteen months of 28 days each, and said that his company had adopted the thirteen-month schedule in 1914 and had found much of advantage and nothing of disadvantage in it as far as the internal records were concerned. The question of the extra day each year, he said, was easily met by including one five-week period about every six years.

"Many concerns have demonstrated that a calendar of thirteen four-week periods is practical and advantageous," said Mr. Bush. "Its use is bound to increase. But the full benefit of such a calendar cannot be realized until it becomes common practice.

"Modern industrial management will more and more demand accurate comparison of past performance as a guide to the intelligent forecast of the future. In this process the inconsistencies of the present calendar, when once fully realized, will not be tolerated. The question of what to do with the extra day in each year and the extra two days in leap year has been sensibly answered by the suggestion that Year Day be observed between December 28 and January 1 and that Leap Day be inserted in the same manner between two of the summer months. The new month would be placed between June and July and would be called 'Sol.'

"It has been suggested that with a simplified calendar we might arrange to celebrate all holidays on Monday. Surely such a week end arrangement would be a boon to millions of people. Such an arrangement would work out exceptionally well for paper mills, avoiding as it would the necessity of starting up on Monday morning, shutting down again for a holiday observed on Tuesday and then starting up again on Wednesday with all the attendant loss of effective time."

Following Mr. Bush's address, the Association went officially on record as endorsing the international fixed calendar of thirteen months, and instructed the secretary to draw up a resolution to be suggested to the American Paper and Pulp Association for adoption at the general meeting of that Association.

Cost Facts and Tariff Making

Warren B. Bullock, manager of the Import Committee of the American Paper Industry, spoke on the subject of "Cost Facts and Tariff Making." Mr. Bullock said, in part:

"The practical side of cost finding was demonstrated in an interesting way at the recent hearings of the Ways and Means Committee of Congress, when the revision of the present tariff was under consideration. In days gone by, tariff laws were written on the basis of politics, the desires of one section for protection leading often to excessive duties on some commodities, while other industries were less favored. To-day, it seems to be a fact that the writing of a tariff law will be based more on facts and demonstrated requirements of an industry than ever before.

"During the last campaign we heard a great deal about a scientific tariff. The enactment of a purely scientific tariff law is doubtless still far in the future, but it is a fact that the present study by the Congressional committee means a closer approach to a scientifically written tariff than has ever before been the case.

"To-day, the cost accountant has come into the picture as never before. The paper industry has been complimented for its presentation of its tariff requirements. The reason for this is that wherever a change in a tariff rate was asked, the paper industry endeavored to base its requests on actual statistical data. In this work the cost accountant has in a measure come into his own. The Congressional committee was pleased at the manner in which the paper industry secured the prices of a foreign laid down paper on the Atlantic coast, computed the cost of production of the comparable domestic paper, and then asked for a duty which would equalize the foreign price with the American cost. On this basis, the American mill asks only an equal right to compete with the foreigner for his home market, depending on the better service that can be given by the domestic mill as compensation for the somewhat lower prices of the foreign product."

Henry B. Fernald, C. P. A., of New York City, talked on the "Recent Changes in Income Tax Law and Procedure Particularly as Affecting the Paper Industry", and cited numerous alterations made in the income tax law as brought about by rulings and court decisions.

D. A. Wilcox, of the Oxford Paper Company, New York City, talked interestingly on "Cost Finding and Estimating," and J. A. C. Kavanagh, statistician of the American Paper and Pulp Association, spoke on "Association Statistics in the Paper Industry," and telling of the statistics which his Association now is compiling and of the extension of the statistical service which is planned.

Second Day Session

On the second day of the meeting of the Cost Association, the two principal speakers at the morning session were W. M. Fischer, of Curtis & Brother Company, Newark, Del., who spoke on "The Reconciliation of Furnish to Production on a 'Bone Dry' or 'Air Dry' Basis", and H. G. Crockett, C. P. A., of New York City, on "Plan Your Work and Work Your Plan". After these two talks adjournment was taken for luncheon.

Luncheon Meeting—The semi-annual luncheon meetings of the Cost Association of the Paper Industry are always highly enjoyable and productive of good talks by representative men of the industry. Col. B. A. Franklin, vice-president of the Strathmore Paper Company, has presided over them with remarkable ability and success for a number of years past. His introductory speeches are always well praised and strike the right keynote. In introducing Dr. E. O. Merchant, statistician of the G. H. Mead Company, who spoke on the business outlook for 1929, Colonel Franklin said that the industrial situation today was never so intense. Although the paper industry stood at the top of all the industries in the country, yet the mills had a good ways to go before they could understand cost estimates, cost of operation, wastes and the 1,001 other facts about the business. Every mill in the United States should be a member of the Cost Association, he said, if only to understand that the difference between cost and selling price equalled profits. He paid a tribute to the work of Thomas J. Burke, the hardworking secretary of the association.

The Business Outlook

Doctor Merchant reminded his audience that the paper industry was essentially a cyclical industry. When business is active and prosperous, more paper is bought and used, and on the other hand, when business is depressed, less paper is bought and used.

The year 1928 was not altogether a bad year for the paper industry, though prices and profits were not all that could be desired. Total production of all grades of paper showed an increase of only 2½ or 3 per cent, owing to a falling off in production of newsprint.

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The business outlook for 1929 was good and consumption for the first half of the year would likely exceed that of the corresponding period of the previous year, but he could not say as much for the second half of 1929. The automobile business would likely fall off and manufacturers might be expected to curtail advertising. Then there would be no national election next fall requiring the use of paper for publicity purposes. Although the paper industry would enjoy an expanding volume of business in 1929, as it did in 1928, it would probably continue to be classed as a depressed industry, because of low prices and vanishing profits.

Uncontrolled Production the Evil of the Industry—Doctor Merchant ascribed the troubles of the industry to uncontrolled production and unintelligent operation. When the paper industry learns that production should be controlled and regulated to meet market requirements, it will prosper and not before. Too many mills have been run on the theory that the more tons they produce and sell, the more money they will make. There was never a greater economic fallacy than that. Such a policy carried out to its logical conclusion would bring an industry to the point where every transaction would be in red, and the paper industry was approaching that point, and rapidly, concluded Doctor Merchant.

Higher Wages—Lower Costs

L. V. Estes, of L. V. Estes, Inc., industrial engineers, Chicago, was unable to present his paper on "Higher Wages—Lower Costs" on account of a sore throat and it was read for him by J. P. Hagenauer.

The scrutiny of costs and study of means for reducing them so as to increase net profits, was observed by manufacturers in times of keen competition. Formerly the first thought when considering cost reductions was to cut wages. The result was never satisfactory, for dissatisfied employees felt that they were asked to sacrifice accustomed comforts to increase the profits and earnings of a more fortunate few. As against this Mr. Estes advocated the payment of higher wages and elimination of excess labor for the reduction of manufacturing costs.

Mr. Estes advocated the 100 per cent Premium Wage Plan as one of the best incentives to increased effort by the employee. The outstanding features of this plan were stated by him as follows:

1—The basis of computation is an **allowed** time.

2—The employee is rewarded for increased effort by being paid for all **"time saved"** at his full hourly rate. **"Time saved"** is the amount obtained by subtracting "actual time worked" from "allowed time".

3—If an operator does not succeed in completing a given job within the allowed time, **he is not penalized directly.** That is—he is sure of getting his regular hourly or base rate whether or not he completes the job within the allowed time.
An employee who continuously fails to make premium should be shifted to other work or released.

4—It is to be desired that each operator earn from 15% to 25% more than the average of his class. This means that from 15% to 25% of the productive hours are being saved for the company; that the output for a given length of time is increased, and that employees will want to stay with the company due to increased pay.
Instead of considering employees who are earning above the average pay, as being overpaid, the company should investigate the men who are not making a premium and find out the reason for their failure. If the allowed time is too low it should be adjusted so that premium can be made. If the employees are too slow or unfitted for the work they should be released or transferred elsewhere. Except in cases of obvious and serious error, however, the allowed time must not be changed, unless the method of operation is changed or the equipment improved.

5—A spirit of fair dealing must be impressed upon the men throughout. The management must realize that employees who earn a premium by added effort and increased production are cheaper at 30% greater wages than low priced workers, who have no interest in their work, or low producers who must be replaced frequently. Training new men is costly.

At the afternoon session, J. A. Grimes, engineer in charge of depreciation studies, U. S. Bureau of Internal Revenue, spoke on "Progress in Depreciation Studies in Industries to Date", and Thomas J. Burke, secretary of the Cost Association, on "Depreciation Reserve Funds and Reproductive Values."

The meeting was closed with a short business session.

Woodlands Section Meeting

Increasing Service Is Aim Exhibited in Interesting Papers and Talks

OFFICIAL announcement was made at the annual meeting of the Woodlands Section of the American Paper and Pulp Association in the Waldorf-Astoria Hotel, New York, on February 20, of the appointment of C. W. Boyce, secretary of the Woodlands Section, as assistant secretary of the American Paper and Pulp Association in addition to his other duties. Since coming from the Forest Service to the paper industry a year ago, Mr. Boyce has been assisting Secretary O. M. Porter in the conduct of the Association's affairs, and his work has been recognized by the formal appointment announced by Mr. Porter after the approval of the association's Executive Committee.

The Woodlands Section held an interesting meeting, with morning and afternoon sessions, interrupted by a luncheon served at 12:30 in the Sun Parlor on the hotel roof.

An Association of Timberland Owners—A. B. Recknagel, forester and secretary of the Empire State Forest Products Association, in an address told of the ideas back of a proposed National Association of Timberland Owners, and of how these ideas can be made effective. Mr. Recknagel said that the proposed organization is backed by a representative body of men who can undertake to speak for the timberland owners, and to act as leaders where leadership has been wanting; in a word; to make the timberland owners articulate as are the manufacturers, the wholesalers and the retailers. He said that the time is ripe for such an Association, and that no one else has conceivably the same stake in progressive forestry as have the owners of the trees themselves. He added that there are many forestry problems which the association could undoubtedly find solutions for, and cited as a comparison the excellent work which the National Committee on Wood Utilization has done.

Maintaining Species on Cutover Land—Wrong methods of cutting pulpwood are leaving pulpwood regions in a partly productive state, M. Westveld, of the Northeastern Forest Experiment Station at Amherst, Mass., stated in an address on "Maintaining Pulpwood Species on Cutover Land". There are three causes for this condition, Mr. Westveld said. The first is destruction of young growth during logging, which causes losses as high as 40 per cent in future growth. The second is the practice of leaving a canopy of old hardwood trees standing after pulpwood has been removed. This retards young growth. The third cause is the presence of fast-growing hardwood saplings which compete with and hold back similar sizes of pulpwood. All three conditions can be easily remedied, Mr. Westveld stated.

Losses in advance growth caused by logging can be reduced through close supervision and inspection, he said, adding that operators must recognize the future crop values in the growing of young stock and put to an end its indiscriminate destruction. This, he said, could be done by organization and education.

"The idea of preserving young growth must be gotten across to the rank and file of the men in woods," Mr. Westveld warned. "It seems to me that this responsibility should rest with the walking boss, who in the past has been inclined to wink at and belittle the efforts made to avoid losses of young trees. Possibly an inspector should be employed whose sole duties would consist of continually checking up to see that losses from this source are kept to a minimum."

Hardwoods, which are actually suppressing reproduction should be girdled, he said. On areas where a possibility exists of marketing hardwoods, girdling should be restricted

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AN item such as is shown above is in daily use, is as staple to Industry as sugar is to the home, therefore, is in constant demand. To meet that demand Republic recommends the Industrial Supply Distributor—his sales force—his warehouse—his service—are prime factors in economical distribution.

This Republic product is well made as time has proven—it's economically made and economically marketed as our distributors' prices prove. Specify it.

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Youngstown, Ohio

Belting - Packing - Hose
Molded Goods - Lathe Cut Goods

REPUBLIC means the Best Mechanical Rubber Goods

to trees of poor form and quality. Experimental girdling plots, established by the Forest Service in 1905 in Corbin Park, N. H., in a hardwood stand containing a dense understory of spruce reproduction, show that even now this class of land girdling can be undertaken at a profit, he declared.

Elimination of young hardwood growth at the same time that stands of pulpwood are logged would relieve the third condition, Mr. Westveld pointed out.

Selective Cutting in Hemlock-Hardwood Forests, was the subject of an address by L. C. Damon, of the Marathon Paper Mills Company, Rothschild, Wis. Mr. Damon said that the cost per cord for restocking or increasing the yield of pulpwood would vary in different localities on account of quality of soils, and species of wood to be grown. There are several types of land available for growth of timber such as hemlock-hardwood type, swamp forest lands, pine lands—both original white pine and mixed Norway and white pine, and jack pine lands.

"Without going into costs," he said, "I am giving my opinion on hemlock-hardwood type for continuous yield. I do not think anyone can determine the exact cost as there are so many things to be taken into consideration. I think the most practical plan of forestry **should not consist in starting with cut-over and ruined lands** and planting new forest which will not be ready to harvest for 100 years or more.

"Forestry in the old countries, and the same will be true here, began almost entirely with tracts of existing forests, managed for continuous production. This involves handling the old stands to prolong their life and insure their reproduction and at the same time stocking up the cut-over land in such a way that the whole forest is able to sustain, in continuous operation, some wood-using plant of efficient size. It necessitates reforestation as the mature timber is removed, taking advantage of the young growth that has sprung up on the cut-over land, improving it and possibly planting here and there the blank acres which nature has failed to restock.

"I think the best possible solution for continuous supply of timber on the hemlock-hardwood lands such as we have in northern Wisconsin and Michigan could be best carried out by an organization formed by a sawmill and paper mill company where each had several years supply of timber in reserve, the sawmill using the hardwoods, and the paper mills the coniferous woods. Selective logging, as I see it, is the only solution for a continuous supply for both saw mills and paper mills.

"It probably would cost in the neighborhood of $1.00 per thousand more to log the timber by this method, but the increased price obtained for the larger and better grade of logs would justify this cost and at the same time would provide more light and space for timber that was left on the land to increase in size and length, depending upon the amount left on the ground which would also improve in quality as the trees grow to maturity.

"Under selective logging in which one-third of the volume of the stand is removed, the growth that may be expected after logging will vary from 100 to 200 board feet per acre per year, according to the distribution of tree sizes left and the original volume. If, for instance, the original stand had 12,000 board feet per acre, and the proportion of trees between eleven and eighteen inches in diameter was fairly large, an annual growth of 200 board feet per acre, after removing 4,000 board feet, is not excessive. If, on the other hand, the original stand had only 6,500 board feet per acre and 2,500 board feet per acre were removed in the first logging, an annual growth of 100 or, at the most, 125 board feet per acre is about all that may be expected. As a general rule, a forest cut selectively will grow at the rate of from two to two and one-half per cent a year. At this rate, the timber removed in the first logging is replaced by growth within twenty or twenty-five years.

"By removing about one-third of the volume in most cases, the investment in timbered lands would be reduced by 50 to 60 per cent, and then entering the land under forest crop laws such as some of the states now have, timber growing should be a paying proposition, assuming stumpage values are the same at the time of second cutting as at present. As a matter of fact, judging by the rate of increase in the past, stumpage prices will probably double in the next forty years.

"Under permanent forest management, there are returns from at least three other sources: "(1) Increase in the volume through growth; (2) Increase in the quailty of the timber as the young timber increases in size; and (3) Decrease in the depreciation of the plant and equipment through the extension of their life."

George N. Ostrander, of Finch Pruyn & Co., spoke on "Organization of the Woodlands Section for Constructive Work", and outlined how and where the Woodlands Section could perform better work and be of greater service to the paper industry.

Other speakers at the meeting included C. C. Heritage, of the Forest Products Laboratory, on "Forestry and Paper Manufacture"; John F. Preston, of the Hammermill Paper Company, Erie, Pa., on the "Economic Significance of Regional Growth Rates"; J. P. Hummel, of the Hummel-Ross Fibre Corporation, Hopewell, Va., on "The Virginia Wood Waste Survey"; H. E. Brinkerhoff, of the International Paper Company, on "Cruising as an Aid in Cutting Operations"; Kendrick Burns, of the S. D. Warren Company, on "Variations in Costs of Logging Pulpwood of Different Sizes", and H. L. Churchill, of Finch Pruyn & Co., on "Selection Cutting in Pulpwood Forestry".

Color at Salesmen's Meeting

Demonstration of Color in Advertising and Printing Presented at Tenth Annual Meeting of Salesmen's Association

THERE was a large and interested audience to hear Arthur S. Allen speak on color in advertising and printing, at the tenth annual meeting of the Salesmen's Association of the Paper Industry, held in the Astor Gallery of the Waldorf-Astoria, on Tuesday morning, February 19, following the business meeting, when new officers were elected for the ensuing year, as follows:

President—Samuel C. Knode, Albemarle Paper Manufacturing Company.

Vice-Presidents—New England Division—Thomas Compton Walsh, Hollingsworth and Vose Company; New York Division—Endicott Rantoul, International Paper Company; Miami Valley Division—Robert T. Houk, Jr., The G. H. Mead Company; Chicago Division— Harold R. Knott, Eastern Manufacturing Company.

Chairmen of Committees—Membership, John A. Wesley, Rhinelander Paper Company; Educational Committee, F. W. Main, Worthy Paper Company Association; Social Committee, R. D. W. Ewing, American Writing Paper Company.

Secretary-Treasurer—D. A. Crocker, 18 East 41st Street, New York.

Color in Advertising and Printing

The platform from which Mr. Allen spoke was gay with an exhibition of colored posters to illustrate his subject, Charts of process colors and displays of colored proofs sent to him from engravers all over the country, produced a kaleidoscopic effect that was almost dazzling.

The Three Dimensions of Color—In introducing his subject, Mr. Allen gave an informing account of the three dimensions of color, first brought to the notice of process engravers some twenty-seven years ago by A. H. Munsell, of Brookline, Mass. These consist of hue, value and chroma. Hue is the color, such as red, yellow, green, blue and purple, while value is the amount of light reflected by any color and chroma its intensity.

Old Spectrums Faulty—Mr. Allen said that the spectrum heretofore used and illustrated in the Standard Dictionary of Funk & Wagnall was inaccurate and the corrected spectrum evolved by Mr. Munsell had been approved by leading physicists. By means of a whirling disk operated by a motor, Mr. Allen demonstrated the value of complementary colors. A combination of opposite colors, balanced inversely accord-

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—and as such has designated Appleton Felts and Jackets as standard for 38 years. Quality and Service are the natural results of experience applied to a product made of the highest grade pure wool in a plant that checks and rechecks all details of manufacturing. Only a quality felt could be produced by our organization, accustomed as it is through 38 years to making quality felts and jackets.

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ing to the products of their symbols, always produces a perfect 5-value grade, the normal color upon which the eye rests most easily.

Advocates Use of Standard Inks—He showed a number of exhibits of progressive proofs of 3-color work from different publications throughout the country, in which there was noticed a great variance of yellow, red and blue as well as progressive proofs made by six different engravers with heterogeneous process colors and he also showed the same plates reproduced by standard process colors, the standard process colors giving a superior result in every case. The use of uniform inks made it possible for an engraver to do harmonious jobs, independent of one another.

The standardization of process colors should be of special interest to paper salesmen, because paper is often blamed for botched printing jobs when the fault lays with the ink. As there are something like 45,000 dots to the square inch in a process plate of three colors, it could be seen that the slightest variation in either the yellow, red or blue would make a great difference in the final result.

Permanent Colors—Permanency is an important thing in process printing, and Mr. Allen said that the various ink manufacturers had done much to help in this particular. He emphasized the importance of changing the construction of the ink, and not the color, to suit the paper. The color should not be changed for different papers. Machine finished paper requires more ink than other papers but no change of color is necessary. The tampering with ink by printers was condemned by him. "Every pressman puts in his own pet gooey stuff. Sometimes the ink is adulterated shamefully. Later when it won't dry, the paper is blamed, instead of the addition of kerosene."

S. A. P. I. Luncheon Meeting

Instead of holding a dinner dance as in former years, the Salesmen's Association of the Paper Industry staged a luncheon meeting in the Sun Parlor of the Waldorf-Astoria on Tuesday afternoon, with President James H. Coy, as toastmaster. Speeches were made by P. H. Whaley, of the Whaley-Eaton Service, Washington, D. C., who discussed "Business Under the New Administration", and S. C. Knode, president-elect, to whom the gavel was turned over by Retiring-President James H. Coy.

Divisional Meetings

Writing Paper Manufacturers' Association

The Writing Paper Manufacturers' Association held its annual meeting in the Waldorf-Astoria Hotel, New York, on February 20, and re-elected D. K. Brown, of the Neenah Paper Company, Neenah, Wis., president for the ensuing year. Col. B. A. Franklin, of the Strathmore Paper Company, Mittineague, Mass., and C. B. Clark, of the Riverside Fibre & Paper Company, Appleton, Wis., were elected vice presidents, Col. Franklin being re-elected and Mr. Clark being chosen to succeed Fred A. Leahy, of the Eastern Manufacturing Company, New York City.

The Executive Committee for the coming year is composed of the above named officers and Stanley W. Morse, of the Valley Paper Company, Holyoke, Mass.; Harold W. Hixon, of Chapin & Gould, Springfield, Mass.; Ward Howard, of the Howard Paper Company, Urbana, Ohio, and A. E. Oberweiser, of the Whiting Plover Paper Company, Stevens Point, Wis. Emmet Hay Naylor, of 44 Vernon street, Springfield, Mass., was again chosen secretary and treasurer.

Aside from its general meeting, the Writing Paper Manufacturers' Association held meetings during the convention of its Fine Paper Division and Sulphite Bond Division, at which matters of interest to the respective divisions were considered.

Tissue Paper Manufacturers' Association

The annual meeting of the Tissue Paper Manufacturers' Association, held in the Waldorf-Astoria, New York, on the morning of February 19 was well attended, and several subjects of prime interest to tissue producers were taken up. The election of officers for the ensuing year resulted in the selection of E. W. Kiefer, of the Port Huron Sulphite & Paper Company, Port Huron, Mich., as president, succeeding Z. W. Ranck, of the Crystal Tissue Company, Middletown, O., while J. M. Conway, of the Hoberg Paper & Fibre Company, Green Bay, Wis., and W. A. Wheeler, of the A. P. W. Paper Company, Albany, N. Y., were elected vice presidents. Emmet Hay Naylor, of 44 Vernon street, Springfield, Mass., was continued as secretary and treasurer.

The Executive Committee of the Association for the coming year will consist of President Kiefer as chairman, Vice Presidents Conway and Wheeler, and J. G. Rosebush, of the Northern Paper Mills, Green Bay, Wis., and F. L. Stevens, of the Stevens & Thompson Paper Company, North Hoosick, N. Y.

American Waxed Paper Association

The annual meeting of the American Waxed Paper Association was the most largely attended in the history of the organization, 43 manufacturers representing 27 mills being in attendance. The session was held on Tuesday, February 19, in the Waldorf-Astoria Hotel, New York. Federal trade practice procedure was the principal subject of discussion, following out the recent conferences of the manufacturers with governmental officials, and two slight corrections were made in the rules submitted for acceptance. There also was a temporary postponement of action on the rule covering ink coverage. The remainder of the program of procedure was adopted without change. Other subjects discussed in the initial session were improvement in statistical reports and the compilation of statistics and reports on the credit, tariff and transportation situations were presented.

The morning meeting was followed by a luncheon, and the afternoon session was devoted to a conference with the representatives of the baking industry and a program outlined for mutual co-operation between the two industries. This program will be discussed further in the hope of eventual formal co-operation.

George H. Gardner, of the Menasha Products Company, Chicago, Ill., was elected president, succeeding R. A. Donnelley, of the Central Waxed Paper Company, Chicago. S. J. Eisner, of the Newark Paraffine and Parchment Company, Newark, N. J., was elected vice president, and Paul S. Hanway, of New York City, was chosen manager and treasurer. These officers with Winthrop L. Carter, of the Nashua Gummed and Coated Paper Company, Nashua, N. H.; R. B. Donnelley, of the Central Waxed Paper Company, Chicago, and Karl Zimmer, of the Otsego Waxed Paper Company, Otsego, Mich., comprise the Executive Committee for the ensuing year.

Binders' Board Manufacturers' Association

The annual meeting of the Binders' Board Manufacturers' Association was held in New York on February 20 in the Waldorf-Astoria Hotel. E. C. Betz, of the Consolidated Paper Company, Monroe, Mich., was re-elected president for the ensuing year, and E. H. Norton, of the C. H. Norton Company, North Westchester, Conn., was again elected vice president. A. B. Goodrich, of the Riverside Paper Manufacturing Company, Glastonbury, Conn., was elected treasurer, and O. M. Porter, of 18 East Forty-first street, New York City, was re-elected secretary.

Members of the Executive Committee of the Association chosen for the coming year are President Betz, Secretary Porter, Vice President Norton, and Leigh H. Davey, of The Davey Company, Jersey City, N. J., and J. P. O'Brien, of the Otter River Board Company, Otter River, Mass.

Cover Paper Manufacturers' Association

The Cover Paper Manufacturers' Association held its annual meeting in the Waldorf-Astoria Hotel, New York, on February 19, and elected Col. B. A. Franklin, of the Strathmore Paper Company, Mittineague, Mass., as president for the ensuing year, succeeding Minor M. Beckett, of the Beckett Paper Company, Franklin, Ohio, deceased. Col. Franklin previously had been vice president of the Association. J. B. Shepherd, of the Peninsular Paper Company, Ypsilanti, Mich., was elected vice president., and Emmet Hay Naylor, of 44 Vernon street, Springfield, Mass., was again chosen secretary-treasurer.

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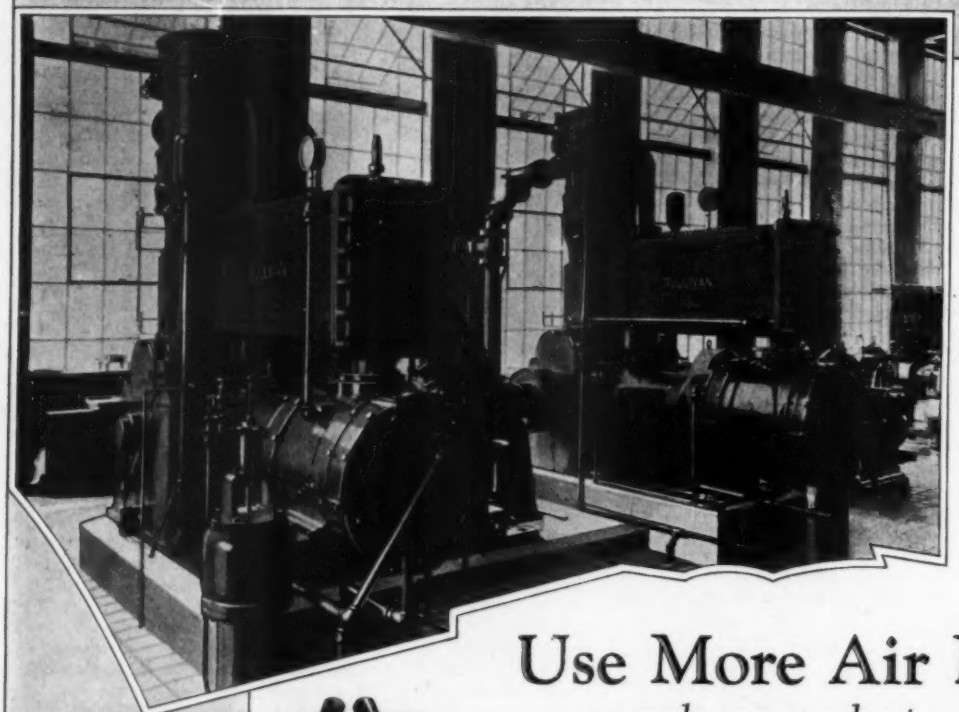

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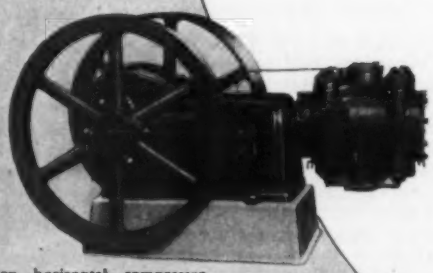

Belt-driven horizontal compressor, capacities 68 to 500 ft.

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Angle Compound Compressors, single-stage horizontal, and single-stage vertical machines of many sizes give you a range of capacities from 68 to 5100 cu. ft. per minute; with drive by belt or direct connection to motor or oil engine.

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President Franklin, Vice President Shepherd and Willis H. Howes, of Knowlton Bros., Inc., Watertown, N. Y., compose the Executive Committee of the Association.

National Sulphite Paper Manufacturers' Association

The National Sulphite Paper Manufacturers' Association held a meeting in the Tea Lounge on the roof of the Waldorf-Astoria Hotel, New York, on February 19, at which J. M. Ward, of the Detroit Sulphite Pulp and Paper Company, Detroit, Mich., was elected president for the ensuing year, and R. T. Davis was elected secretary.

The Executive Committee of the Association for 1929 consists of President Ward, R. L. Sisson, Jr., of the Racquette River Paper Company, Potsdam, N. Y.; John E. Alexander, of the Nekoosa-Edwards Paper Company, Port Edwards, Wis.; J. L. Stille, of the Continental Paper and Bag Mills Corporation, New York City, and E. L. Edmonds, of the Wausau Paper Mills Company, Wausau, Wis.

United States Pulp Producers' Association

The annual meeting of the United States Pulp Producers' Association was held in New York on the afternoon of February 19 in the Waldorf-Astoria Hotel, with President W. H. Savery of the Shenandoah Pulp Company, Harpers Ferry, W. Va., presiding and with a good attendance of the membership present. Various matters of interest to the members were discussed.

Mr. Savery was re-elected president for the ensuing year, and Norman S. Stone, of the Mosinee Paper Mills, Mosinee, Wis., was again elected vice president, and O. M. Porter, of 18 East Forty-first street, New York City, was again chosen secretary-treasurer.

The above officers, together with D. C. Everest, of the Marathon Paper Mills Company, Rothschild, Wis.; J. P. Hummel, of the Hummel-Ross Fibre Corporation, Hopewell, Va.; George W. Sisson, Jr., of the Racquette River Paper Company, Potsdam, N. Y.; J. M. Ward, of the Detroit Sulphite Pulp and Paper Company, Detroit, Mich., and Norman W. Wilson, of the Hammermill Paper Company, Erie, Pa., compose the Executive Committee.

Paper Twine Spinners

The use of paper clothing, paper umbrellas, paper furniture and other articles fashioned of paper has become so widespread in the United States during the past few years as to have led to an informal conference of paper twine spinners during the convention of the American Paper and Pulp Association in New York. The conference, held on February 19 in the Waldorf-Astoria Hotel, was strictly informal, but the formation of an association was discussed, and it was said afterwards that it is probable a Paper Twine Spinners' Association will be organized in the not distant future.

Notes of the Convention

The social side of the convention of paper manufacturers in New York this year was featured by a trend away from formal dinners in the evenings to luncheons of a rather informal nature. Although there was at least one dinner of important character on each evening of the convention, there were a "flock" of luncheons each day. Starting with Monday, February 18, the first day of the convention, the Gummed Industries Association and Cloth Tape Manufacturers gave a luncheon in Room 110 of the Waldorf-Astoria, while on the following day there were luncheons of the Supply and Equipment Section of the American Paper and Pulp Association in Room 142 of the Waldorf, the National Sulphite Paper Manufacturers' Association in the Tea Lounge on the roof of the hotel, the American Waxed Paper Association in Room 112, and the Salesmen's Association of the Paper Industry in the Sun Parlor on the hotel roof. The Wednesday luncheons included those of the Cost Association of the Paper Industry in Room 115, the National Committee on Waste Utilization and Stream Improvement in Room 100, the Woodlands Section in the Sun Parlor on the hotel roof, he Binders' Board Manufacturers' Association in Room 114, the Paper Makers' Advertising Club in Room 112, and the Groundwood Tag Manufacturers in Room 120. On Thursday, the last day of the convention, were the luncheon of the Glazed and Fancy Paper Manufacturers' Association in Room 112, and the President's luncheon in honor of retiring president D. Clark Everest of the American Paper and Pulp Association in Room 115.

The Hudson Bag Company, Inc., of Brooklyn, N. Y., and Bellows Falls, Vt., held "open house" in Suite 466-7 of the Waldorf-Astoria during the convention, with A. Mazer, president, and other officials of the company receiving the guests. Bulkley, Dunton & Company, of New York City, also held "open house" in Suite 413 of the hotel with Fred Enders, of the wood pulp department, and E. G. Lloyd, of the paper department of the firm, greeting friends, while the Public Service Cup Company, of Brooklyn, N. Y., and the Tulip Cup Corporation, of College Point, N. Y., occupied Suite 605 for the reception of convention guests with A. J. Sachs and W. R. Lenderking on "deck".

W. Noble Gillett, of the Chicago Paper Company, 801 South Wells street, Chicago, Ill., retiring president of the National Paper Trade Association, remained in New York after the close of the convention, and sailed on February 27 for a three months' Mediterranean trip, accompanied by Mrs. Gillett, to recuperate from his arduous labors as executive head of the paper merchants' organization during the past year.

There was a note of sadness permeating the convention on the realization that this would be the last paper manufacturers' convention held in the palatial old Waldorf-Astoria. The fact was frequently referred to and there was downright regret expressed over the passing of this far-famed hostelry which has been the scene of American Paper and Pulp Association conventions for over half a century. The hotel is to be closed the end of March and torn down to make way for an immense office building to be known as the Waldorf Building and which will have the largest floor area of any structure in the country. Unconfirmed rumors at the convention said that the Pennsylvania has been selected for the next A. P. and P. A. convention, in 1930.

Supply and Equipment Section

The Supply and Equipment Section, Inc., of the American Paper and Pulp Association held its annual luncheon-meeting on February 19 in the Waldorf-Astoria Hotel, New York. President W. N Wilkinson presided. Oliver M. Porter, secretary and treasurer of the section, spoke briefly and said that the contribution of funds by members of the section had been used for the general work of the A. P. & P. A., and also for waste utilization work, and added that the officers and members of the association greatly appreciated the financial assistance afforded by the supply section.

Mr. Wilkinson announced that it is planned to have more frequent meetings of the Executive Committee of the section with a view to pushing the work of the organization more effectively, and urged that every member of the section co-operate to the fullest extent by making suggestions and aiding the officers and Executive Committee in order to increase the value of the supply section to the members and to the paper industry. A drive for new members was discussed, and President Wilkinson stated that it is hoped to bring into the membership of the section every manufacturer of paper mill equipment and raw materials. The meeting was in the nature of a round-table informal discussion.

Included among those present were: J. A. Cameron, of the Cameron Machine Company; H. C. Strike, of the Combustion Engineering Company; W. W. Cronkhite, of the General Electric Company; Eugene Merz, of Heller & Merz; H. C. Barbour, of the International Pulp Stone Company; Phillips Dennett, of the Bird Machine Company; C. L. Ellis, of the Downingtown Manufacturing Company; George Spencer, of the Minton Vacuum Dryer Corporation; W. H. Millspaugh, of the Paper and Textile Machinery Company; John Cornell, of the Paper Mill and Wood Pulp News; A. A. Tanyane, of

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the Paper Trade Journal, and E. B. Fritz, of the Paper Industry.

Paper Mill Supply Dealers' Dinner

One of the enjoyable and time-honored social events of Paper Convention Week in New York was the twenty-first annual banquet and entertainment of the New York Association of Dealers in Paper Mills' Supplies, Inc., given on the evening of February 20 in the grand ballroom of the Commodore Hotel. As formerly, this dinner was arranged for Paper Week so that the supply dealers in the metropolitan area could entertain their mill friends who were in New York for the convention, and as usual a generous sprinkling of paper mill officials was noted in the large assemblage at the dinner.

Something of a new record in attendance was established at this year's supply dealers' banquet. There were approximately 260 present, and paper mill supply merchants from various other cities, including Chicago, Boston, Philadelphia, Baltimore, Newark and other places, came to join in the festivities and to greet their mill friends and friends in the New York paper stock trade. A sumptuous repast was served, and after the dinner was over a splendid vaudeville entertainment was staged by an array of topnotch artists who performed on a stage erected in the center of the dining hall, the big show lasting until very nearly midnight. A souvenir program and menu booklet, handsomely printed and containing advertisements of firms in the trade, was distributed. A feature of the entertainment program was the community singing led by Harry Armstrong, far-famed composer of the old favorite song "Sweet Adeline."

The Banquet Committee of the Association having the dinner in charge consisted of Walter H. Martens, of George W. Millar & Company, Inc.; Alfred J. Moran, of A. J. Moran & Company, Inc.; Charles Passannante, of the Wilson Paper Stock Company, Inc.; Frederick H. Chase, of Daniel M. Hicks, Inc.; and Louis Gottlieb, of the Leshner Paper Stock Company, Inc.

Paper Merchants Meet and Elect

National Paper Trade Association Holds Twenty-Sixth Annual Convention.

THE twenty-sixth annual convention of the National Paper Trade Association at the Waldorf-Astoria Hotel, New York, on February 18-20, inclusive, was largely attended by leading paper merchants from various parts of the country, and, under the direction of Secretary Frank E. Floyd who was inaugurated executive secretary of the organization just a year ago, interesting and instructive meetings were held during the three-day gathering. On February 19, the Fine Paper Division of the association convened, and there were also various committee meetings including the Gummed Tape Committee, Efficiency Committee, Bag Committee, Survey Committee, Twine Committee, and Tissue Committee, and on February 20 the Wrapping Paper Division met in the forenoon, while the general business meeting of the association was held in the afternoon.

At the annual election of officers, Harry W. Mathewson, of the Paper Supply Company, Minneapolis, Minn., was elected president for the ensuing year to succeed W. Noble Gillett, of the Chicago Paper Company, Chicago, Ill., Mr. Mathewson previously having been vice president in charge of the Wrapping Paper Division of the association. Kit S. Warner, of John F. Sarle, Inc., New York City, was re-elected vice president in charge of the Fine Paper Division, and Arthur W. Blackman, of the D. F. Munroe Company, Boston, Mass., was elected vice president in charge of the Wrapping Paper Division, succeeding Mr. Mathewson. Charles Addoms, of the Miller & Wright Paper Company, New York City, was elected treasurer, and Frank E. Floyd, of 420 Lexington avenue, New York City, was again named secretary.

The convention of the paper merchants was brought to a close with the Association's twenty-sixth annual banquet at the Hotel Roosevelt in New York on the evening of February 20. It was a gala affair and largely attended.

The Forthcoming Chemical Show

The Twelfth Exposition of Chemical Industries which will open at the Grand Central Palace, New York City, May 6 to 11, bringing together thousands of chemists, chemical and research engineers, manufacturers and buyers from forty odd industries, is particularly significant of the advancement made in the chemical industries field during the last quarter of a century.

The various groups of this important industry as represented at the exposition will exhibit the most modern equipment and advanced practices of chemical engineering and chemistry. A cross section of the metals group shows fifteen exhibitors who will show various alloys and include such outstanding producers as Crucible Steel, Vanadium Steel, International Nickel, Duriron, Inert Metal Products, Inc., Industrial Welded Products Co., Carpenter Steel Co., Globe Steel Tube Co., Titusville Forge Co., Nelson Metzler Corp., Lalance-Grosjean Mfg. Co., Ludlum Steel Co., Central Alloys Steel Co., Babcock & Wilcox Tube Co., and Fansteel Products Co. For the first time there will be exhibited a new acid resisting alloy by Krupp. This metal has many special and unusual features that will be of great interest to the chemical industry. Considerable research and new development work has been undertaken during the past year in perfecting special alloys. The latest discoveries in this field will be presented in attractive displays by foremost manufacturers in this field of endeavor.

In the Laboratory Supply and Equipment group a large number of interesting exhibits will be assembled: exhibits of laboratory furniture; general laboratory apparatus and supplies; special laboratory equipment; filter papers; optical instruments; laboratory chemicals; platinum ware; instruments of precision; electrical apparatus; laboratory balances; glassware, porcelain, silica ware and plastic compositions. This group will have in its various exhibits complete displays, charts and graphs of all equipment and the functions it is designed to perform.

The Instruments of Precision group will have a number of exhibits, among which will be an exhibit of a spectrophotometer and hydrogen-ion colorimeter. These two will be of particular interest to the color and dye industry. The hydrogen-ion colorimeter is new and will be exhibited at the Exposition for the first time. A number of balances, microscopes, high temperature furnaces and color analyzing apparatus will also be exhibited. A new method of connecting vitreosil pipe lines will be presented at the coming exposition.

Attendance at the Chemical Industries Exposition is confined almost entirely to users and buyers of chemicals and chemical equipment. Admission is gained only by invitation and registration. There are no tickets sold. To the last exposition there came 67,000 men looking for ideas and information to aid them in the conduct of their business. This picked group of interested visitors came from 810 cities and towns in 40 States and 119 cities and towns in 39 foreign countries.

At the exposition this year Export Day, Thursday, May 9, will be awaited with much interest by the foreign representatives and special attention will be given this feature by various exhibitors who plan to have their export managers and foreign sales departments in their booths to give every possible assistance to foreign buyers.

The Students Courses are being arranged and speakers assembled for the various lectures. The course will be under the direct supervision of Dr. W. T. Read, Professor of Chemistry from Texas Technological College. The enrolled classes promise to exceed the record of 162 special students who attended the complete course at the last exposition.

The board of directors of the Mine and Smelter Co. met January 22, and elected as president of the company, A. H. Seep of Denver, Colo., who has been associated with the company for the past 27 years. J. H. Fennessy, for twenty-five years the company's chief executive, is retiring, but will continue as a director of the company. Clark Grove was elected executive vice president and will move to Denver, Colo., where the general offices of the company have been located since February 15.

What Price Lubrication?

Between theoretically perfect lubrication and the average lies a wide field paved with wasted dollars.

Texaco Lubrication Service saves these dollars.

In industrial plants of all kinds throughout the world, in the land transportation systems, in marine service and in the great mining plants of the world, Texaco engineers are daily opening the way to better lubrication.

For The Texas Company is a great "complete cycle" organization. It manufactures a Texaco lubricant for every purpose. It owns and operates its own wells, pipe lines, refineries, manufacturing plants and transportation facilities. It is a company that provides a complete lubrication service.

Texaco lubrication engineers are specialists—retained to cooperate with you—to study your every requirement and specify exactly the proper lubricant in every case.

And wherever you are, no matter how great the range of your operations, this service, and the same uniformly high quality lubricants are always freely available.

TEXACO LUBRICANTS

The Texas Company

17 Battery Place, New York City

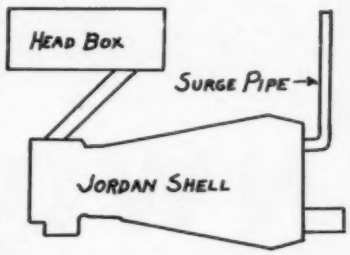
Offices in Principal Cities

THERE IS A TEXACO LUBRICANT FOR EVERY PURPOSE

Practical Helps for the Mill Man

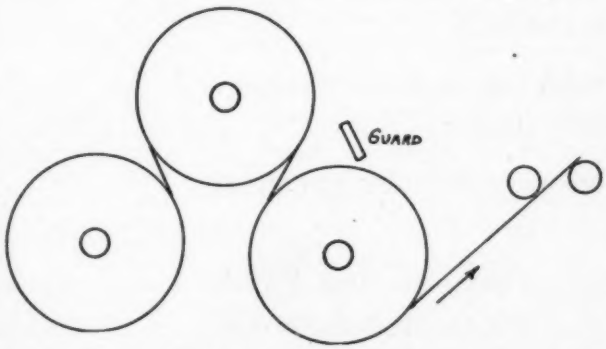
Surge Pipe for Jordan

THE head box and pipe connection to a jordan had been made in such a manner that on some occasions air was permitted to enter the jordan and thus cause surging of the stock. To permit such air as entered the machine to escape and to eliminate tendency of surging, a simple pipe connection was made in the top opening on the discharge end of the jordan unit. A 1-inch pipe extending vertically from the jordan to a height sufficient to prevent an overflow of stock from the open top end was connected through an elbow and other necessary fittings to an opening in the hand hole plate covering the top opening in the discharge end of the jordan shell. This very simple arrangement has corrected the difficulty formerly encountered with air in the shell as well as surging of stock.



Guard for Paster Dryer

IN OPERATING a paster in a plant manufacturing high grade papers, the superintendent noticed that the operators were subjected to unnecessary accident hazard at the dry end of the machine. The clearance between the dryer faces was small, and in other ways through carelessness or unavoidable slipping, the hand of an employee might be easily injured in the machine. A wooden guard with metal supports was designed and installed on the paster to reduce this hazard to a minimum. The guard was of three-quarter inch hardwood about five inches wide and of a length to cover the entire face of the machine. The metal supports bolted to the wood guard were conveniently shaped and bolted to the machine frame of the paster. The bottom of the guard was set about 1 inch from the face of the last bottom dryer. This distance offered sufficient clearance for conveniently working about the machine. Such precaution often aids in the prevention of accidents and makes operators contented.



Suggestions for Belt and Pulley Arrangement

IN MAKING any equipment installation involving the use of belting and shafting for operation, it should be borne in mind that machinery and shafting should be arranged to permit the belts to run off each shaft in opposite directions in order to reduce bearing friction and wear. The belts running in opposite directions should be placed as close together as possible, while belts running in the same direction should be separated. Pulleys should be a little wider than the belt. At the same time, pulleys should be placed as close to hangers as possible in order to reduce shaft flexure. On ordinary drives, the angle between the belt and the floor should not exceed 45°. If belt tighteners are necessary, they should be applied to the slack side of the belt and near the smaller pulley. It is important to keep shafts in line, and the direction of belt motion should place the slack side of the belt uppermost. Pulleys with too high crown should be avoided. Too high crown on the pulleys causes the belt to flap on slack side, strains the center section, and reduces the arc of contact on the edges.

Primer Pump Capacity Formula

A PUMP formula that is frequently used when calculating capacity of vacuum pump to be used as a primer may be expressed as follows:

$$\frac{\text{Volume} \times C}{T} = \text{C. F. M.}$$

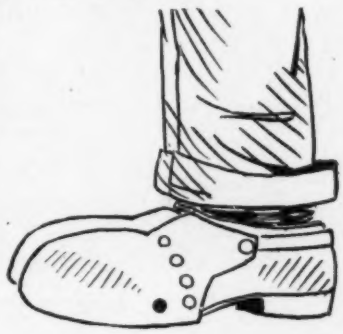
In this formula the volume is expressed in cubic feet.
T represents the time in minutes.
C is usually taken as 2 for 15′ lift.
If the lift is other than 15′:

$$C = \frac{30}{30 - \text{suction lift in feet or inches of vacuum}}$$

C. F. M. = cubic feet per minute

Wood Room Safety Devices

ONE very well-known west coast mill has furnished wood room workers with safety devices. These devices include steel shoes to prevent bruising of feet by falling wood as well as goggles and masks to protect the face from flying pieces of wood and sawdust. Such devices have reduced wood room accidents to a minimum.



Announcement is made of the marriage on February 8, 1929, of Royal S. Kellogg, secretary of the News Print Service Bureau and Janet Reid Thompson, daughter of Mr. and Mrs. Alexander Hamilton Reid of Chicago. Mr. and Mrs. Kellogg will reside at thirty-one Bayley avenue, Yonkers, N. Y.

A recent announcement that the new eastern branch office of Foote Bros. Gear and Machine Co. would be located in the Woolworth Building, New York City, has been recalled, and the correct address now is, Transportation Bldg., 225 Broadway, New York City. This office is in charge of E. A. Phillips, to whom customers and prospects in the eastern territory should direct their communications.

The Lincoln Electric Company, Cleveland, Ohio, manufacturer of "Stable-Arc" Welders and Linc-Weld Motors, announces the appointment of C. M. Taylor as sales manager. Mr. Taylor has been factory manager of the company since 1923 and in 1925 was elected vice president.

KENWOOD

WOOL PRODUCTS

REG. U. S. PAT. OFF.

KENWOOD TANNED FELTS

THESE Felts have most emphatically demonstrated their superiority in all classes of mills.

They most satisfactorily meet the constantly changing conditions of day-after-day running.

They best meet, not only one condition, but ALL conditions.

They retain their Strength, Openness and Finish over a greatly lengthened life. The result is continued high production at lower felt cost per ton.

These advantages are due solely to basically sound DESIGN and to the patented Kenwood TANNING processes by which these felts are treated.

F. C. HUYCK & SONS

KENWOOD MILLS, ALBANY, N. Y.

KENWOOD MILLS LTD. ARNPRIOR, ONTARIO

The Northwest Paper Company Merger

Intensive Forest Products Utilization Planned in Weyerhaeuser Combine at Cloquet, Minnesota

ONE of the largest mergers in the recent annals of the American pulp and paper industry has just been announced—the amalgamation of three big lumber concerns, a railroad, two hydroelectric plants, a logging company and other subsidiaries with The Northwest Paper Company, of which the headquarters are at Cloquet, Minn., and the plants there and at Brainerd, Minn.

Capital stock of the new corporation exceeds $14,000,000. Its assets, as of February 1, are more than $21,000,000. All of the companies involved—including the paper company, the Cloquet Lumber Company, Johnson-Wentworth Company, The Northern Lumber Company, Duluth & North Eastern Railroad, General Logging Company, the Northland and the Northern power companies, and several other subsidiaries—are members of the Weyerhaeuser affiliation of forest products manufacturers and distributors. So no essential change of ownership takes place, R. M. Weyerhaeuser continuing as chairman of the board of directors and H. C. Hornby of Duluth, president.

Yet the changes in corporate form are of more than casual interest in the paper industry for four reasons. First, the merger brings to a culmination a development extending over several years, in the intensive utilization of forest products as a successful means of conservation of natural resources. It looks to the establishment of Cloquet as the first permanent exclusive wood-working center in the country. It effects certain operating economies which will be studied with interest by other paper men, and, considering a possible reforestation project that is involved in the new company's plans, it suggests a solution of the peculiar timber conditions found in northern Minnesota.

Variety of Lumber Species Surrounding Cloquet

Originally Cloquet, by virtue of the presence of the Cloquet river which provided hydroelectric power and of large stumpages of genuine white pine and Norway pine timber in its immediate vicinity, was a typical sawmill center. From as much as 40 years ago, it has distributed all items and all grades of white pine and Northern pine lumber to the building trades in the eastern half of the United States. Some years after the lumber industry was well established there, a paper plant was founded, attracted by the presence of considerable spruce and balsam in the region.

This departure was the first step toward diversification as suggested by the mixture of species in the northern timberlands. But in addition to the lumber species and the preferred pulpwoods, these stands include a large footage of such species as jack pine, popple, cedar, tamarack, balm of Gilead and birch. Early loggers could not harvest these along with the cream-species. For some of them required special manufacturing facilities which did not exist in the North-country, while others were simply devoid of commercial value. So the timber-cutter of a generation ago found it uneconomical to operate in this territory after the superficial harvest had been taken off. In consequence, most of the larger sawmills moved, one after another, to the South or the far West, and the pulp and paper industry has looked with increasing concentration to Canada as its source of supply.

Methods of Complete Utilization Discovered

But several years ago The Northwest Paper Company employed technicians to investigate possible means of utilizing jack pine, popple and other minor species. This laboratory-research resulted in the discovery of methods of using these woods to produce a wide variety of pulps and papers.

Then the Weyerhaeuser Forest Products office in St. Paul offered to the shippers of the nation a special service in designing crates and shipping containers that would economize in freight rates and in lumber-consumption. Over a period of six years, this crating department has solved some 600 specific problems in crating, most of them requiring the invention of new types of packing cases. And incidentally, this work resulted in three things—a demand for cut-to-size crating that would eliminate part of the labor in industrial shipping departments; discovery of a thoroughly satisfactory use for short-length and other timber rejected by the lumber-mills; and the recognition that some uncommercial species of wood would serve adequately for this special purpose.

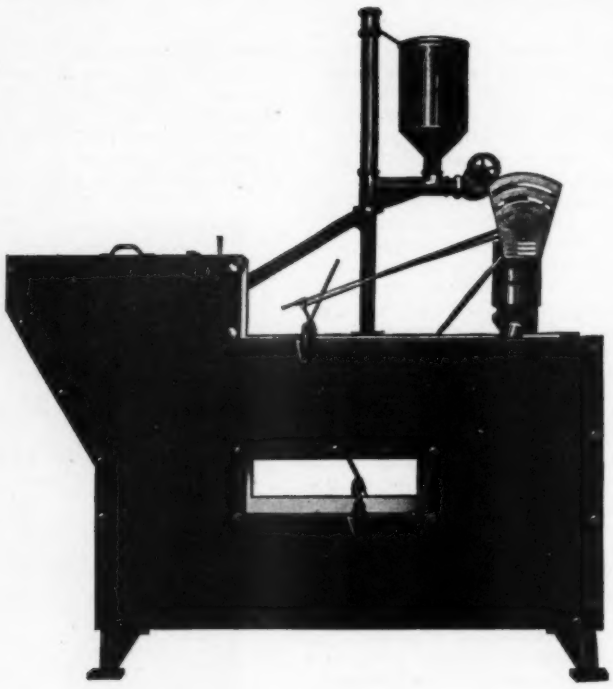
R. M. Weyerhaeuser
Chairman, Board of Directors, The Northwest Paper Co.

Moreover, outside industries, entirely independent of Weyerhaeuser ownership, were encouraged to come in. Among these are Rathbone, Hair & Ridgway, box-makers, controlled by Armour & Co., who consume a large quantity of bolt-stock of various species in their production, and the Berst-Foster-Dixfield Company, of which the daily output aggregates some 70,000,000 toothpicks and 500,000 clothespins, besides paper plugs, matchsticks and numerous other wooden articles. This operation provided an outlet for much of the birch and other non-lumber and non-pulpwood timber brought down from the woods.

Finally, practice of the principle of conservation through intensive utilization led to the establishment of the Wood Conversion Company, the by-products division of the Weyerhaeuser affiliation, to manufacture Balsam-Wool, the insulating blanket, and Nu-Wood, a rigid structural insulation from the trimmings and scrap thrown out by the sawmills.

In short, the development at Cloquet has been along three

Automatic ~ Instant



The DeZurik Stock Consistency Regulator in its operation is automatic and instant—controls stock density as easily as looking at a pressure gauge—and without power. With it no stock can go over the machine while the valve is being opened or closed—no stock can be out of balance with the weight required for a specific run. Water is added instantly to correct the density if the detector shows the stock being furnished is not the right density, after the stock passes the first detector.

—and unlike other regulators, the DeZurik Stock Consistency Regulator has its own constant water head control—a very important feature because water pressures vary in the different mills.

Built along the quality lines of other Valley Equipment, this patented regulator is worth your careful investigation. Write now for complete details.

VALLEY IRON WORKS CO.

Machinery for Paper and Pulp Mills

APPLETON WISCONSIN

New York Office: 350 Madison Avenue
Western Manufacturing & Sales Division: Smith & Valley Iron Works Company
Portland, Oregon

distinct lines: the utilization of all the "ripe" trees, of whatever species, available; the utilization of a greater part of each tree; the elimination of waste through the utilization of scrap. And manufacturing facilities have followed each new step in this trend. Investments have been increased as required to make every phase of the intensification and diversification commercially feasible. The result is a variety of operations unlike that found in any other forest products center in the country.

So it is feasible to continue to log these peculiarly miscellaneous forests. But economizing at every step of the way is needed to make such operation profitable, and economy is accomplished by the present merger. For it makes it possible to lay out logging and transportation plans in advance, so as to take care of the special requirements of every unit in the manufacturing network, and to provide materials for steady and permanent operations. This is accomplished through the following plan.

The Operating Plan

The Timber Department, managed by G. E. Marshall, former member of the U. S. Forest Service, handles The Northwest Paper Company's holdings of stumpage.

Logging is done by the General Logging Company, under the direction of Frank A. Kelly, general manager, and J. C. Campbell. This subsidiary has had 2,000 men in the woods this season and, by unified planning of its work, is able to supply an ample quantity of the correct species of timber to assure continuous operation to each of the various fabricating units.

Transportation of the forest-crop is charged to the Duluth & North Eastern Railroad, of which Charles A. Jensen is superintendent. This property consists of some 60 miles of main line classed as a common carrier, extending North and East of Duluth, and 90 miles of other main line, besides the various branches that tap the company's holdings near the Canadian border.

The Pulp and Paper Division—The Pulp and Paper Division of The Northwest Paper Company is under direct charge of W. H. Kenety, vice-president. Its plant at Cloquet is a modern, practically fireproof structure, under the superintendence of W. K. McNair, unique in its facilities for utilizing a

W. K. McNair, superintendent of the Cloquet paper plant of The Northwest Paper Company (at the right), and M. J. Foley, superintendent of the papermaking department, were checking over a sample of the stock for the 1929 score-card of the Chicago Cubs, and the machine before which they stand was in the midst of the 15-ton run required for this job, when the photographer happened along.

variety of woods and for producing virtually any grade of pulp or of paper. This mill includes a kraft mill, a sulphite mill of which J. W. Stevens is superintendent, the only soda mill West of Ohio and East of the Pacific coast, under supervision of C. K. Textor, and a sodite mill unlike any other in the country, upon the development of which approximately $1,000,000 was spent. The paper-making department, of which M. J. Foley is superintendent, has three machines.

These facilities make possible the employment of several north-country species hitherto not extensively used for pulp-making—notably jack pine, popple, birch, tamarack and balm of Gilead—besides all the spruce found in the region. This provides a profitable outlet for such pulpwood of these species as The General Logging Company takes out of the woods. The diversified pulp-production enables the Cloquet plant

During the daytime, H. C. Hornby is president of The Northwest Paper Company at Cloquet, but in the evening he is just "Grand-dad." Asked to pose for a picture for the accompanying article, Mr. Hornby expressed a preference for the sitting to be at home with Mistress Dorothy Jane, his granddaughter, rather than in his office or about the mills.

to operate without purchase of pulp from other sources—but, in fact, to sell it, both bleached and unbleached, to industries requiring it—and to make paper absolutely without the use of old paper stock, every pound being produced entirely from virgin wood.

Production includes both fine and coarse papers: Klo-Kay English Finish Book; Klo-Kay Offset, Klo-Kay Label, also tablet, writing and drawing papers; Nortex, Arrowhead and Carleton Envelopes; No. 1 and No. 2 Kraft, gumming papers, and other specialties. Distribution of the line is national, through sales offices in New York, Chicago, St. Louis and St. Paul. C. I. McNair, Jr., is sales manager.

With more than 600 men on the payroll, output aggregates 100 tons a day. The Cloquet factory is in the midst of an expansion-program which contemplates tripling present facilities. New machines will be installed in the paper-making department in the near future. A large laboratory is maintained with a staff under the direction of Dr. Walter Hoffman. All these developments are for the purpose of further diversifying the production as well as to increase capacity of the present lines.

At Brainerd, Minn., is the second plant of the Pulp and Paper Division, of which Thomas G. Johnson is superintendent. Its output is confined to newsprint and allied lines, the equipment consisting of a pulp mill and one Fourdrinier. Power is supplied by The Northern Power Company.

The Lumber Division and Other Related Activities—Second among the activities at Cloquet is the Lumber Division of the amalgamated concern, in charge of Vice-President Sherman L. Coy. This unit runs a new up-to-date sawmill, including the re-manufacturing plant in which 4-Square packaged lumber is prepared. Total production of genuine white pine and northern pine aggregates some 90,000,000 feet annually, continuing all grades of lumber which the building trades and wood-working industries of the eastern half of the United States have been accustomed to receiving from Cloquet for 40 years. The Lumber Division consumes all the saw timber of preferred lumber species which The General Logging Company harvests.

The third part of the manufacturing organization is the Lumber Specialties Division, with Vice-President W. B. Driscoll in control. This represents an entirely new departure in

When . . the Prince of Wales registered at the Burnet House in Cincinnati

CINCINNATI was all agog back in 1860 when the Prince of Wales, afterward Edward VII of England, visited Cincinnati in his tour of the United States.

Only a few years before this time Asa Shuler and J. W. Benninghofen had formed a partnership up in Hamilton for the manufacture of a better kind of paper making felt.

No doubt they would have liked to take part in the festivities, at least to see what royalty looked like. But twenty miles in those days was a long, long way. It meant sacrificing an entire day from their rapidly growing business.

The descendants of these two men are making felts today, but much better felts than these pioneers in 1858.

And why should they not be better? All can buy wool, set up carding, picking, spinning, weaving, and other machinery necessary for making felts. But it is only experience that can tell which is the best wool or combination of wools, that can decide how tight to spin the threads, how to weave them and full the finished felt so that it will be a felt that makes money for the manufacturer who uses it.

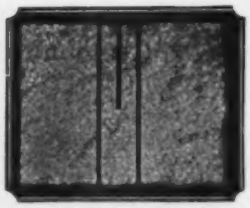
Little wonder that Hamilton Felts are felts that take out water in more than usual quantities; that wear long with less down time for washing; that help to produce a better finished piece of paper. In back of them is this 71 years of experience.

Try a Hamilton Felt on your hardest machine. Give it every test of inspection and service you think a felt ought to have. You will want to use Hamilton Felts on all your machines.

Ask the Hamilton Felt Man the next time he calls. He is a practical paper maker as well as a felt expert. Or, write to us direct.

Shuler & Benninghofen, Hamilton, Ohio

Miami Woolen Mills
ESTABLISHED 1858



Hamilton Felts are marked by two blue lines full width of the felt and by one shorter blue line midway between them.

Hamilton Felts

industry for, while it continues to produce cut-to-size crating, it has reached out into a new field—the semi-fabrication of wooden parts for industries that can complete their manufacture and then assemble them into finished products, such as automobiles, furniture, implements and various machines. This division operates a specialized sawmill and a cut-up plant designed to saw 35,000,000 feet of small logs and bolt stock annually.

Finally, this exceptional manufacturing set-up is completed by the other industries at Cloquet not included in the merger. These include the Wood Conversion Company, which uses

On the loading platform of the paper mill at Cloquet, W. H. Kenety, vice-president of The Northwest Paper Company, assures the boys that, though his new office includes the administration of all kinds of forest products operations, he has lost none of his interest in paper.

what used to be waste from sawmill operations to make two building specialties—Balsam-Wool and Nu-Wood; the box factory of Rathbone, Hair & Ridgeway, and the wood specialties plant of the Berst-Foster-Dixfield Co. All these concerns receive their bolt stock and other raw materials from The Northwest Paper Company and their power from The Northland Power Company.

Thus it can be seen that the merger knits closer together a various and yet inter-related group of industries, making increased efficiency and far-seeing planning possible for each unit. Of course, some program of reforestation is essential to make the Cloquet operations permanent in a complete sense.

The Prospect of Reforestation

Two years ago the constitution of Minnesota was amended to permit the legislature to encourage reforestation on privately owner lands through a new method of taxation. So last year the legislature passed an auxiliary forest act which provides, in substance, that any owner of land suitable for reforestation but not for agriculture may enter it as auxiliary forest land under contract to devote it to growing timber as a crop for fifty years.

No land has been entered under this law as yet. This has not surprised the legislators responsible for the act, for they realize that the tax fixed was arbitrary and might have to be revised in accordance with subsequent experience. To get that experience an interim commission of the legislature was appointed last year. It has studied the situation, not only in Minnesota, but also in Michigan, Louisiana, and the few other states that have similar laws, and it has prepared a recommendation, which, it is expected, will be submitted to the legislature at its present session, that the tax rate on auxiliary forest lands be adjusted in the light of its investigations in such a manner as to put the entire purpose of the present legislation on a practical operating basis.

Now, H. C. Hornby, president of The Northwest Paper Company, states that, if the legislature adopts the recommendation of its interim commission, the company will undoubtedly enter a contract to reforest a portion of its present holdings to insure, under scientific forest management, a sufficient annual timber crop to keep the Cloquet industries operating and to establish them on a permanent basis. And Mr. Marshall, manager of the timber department, gives assurance that this is entirely feasible from the technical forestry standpoint.

So the culmination of this far-visioned program for intensive forest-products utilization seems at hand. Twenty years ago the Weyerhaeuser interests gave Minnesota a tract of land near Cloquet for experimental work in reforestation, and a forestry experiment station of the University of Minnesota is established there now. Since the town was destroyed by fire ten years ago, not only have its mills been rebuilt, but other cooperating industries have been encouraged to come in. Investments have been increased. Research has been carried on. New products and by-products have been put into production and distribution.

This new merger reinforces the whole program and advances it one step nearer to complete stability and absolute permanency. Whether or not reforestation becomes practical as contemplated, The Northwest Paper Company now is in a position to utilize the forest crop more intensively and more efficiently than ever heretofore. And Cloquet appears in a new light as an ideal example of practical forest conservation through the diversification of its manufacturing facilities.

Warning Against Fraudulent Ranger Courses

The National Better Business Bureau, Inc., the U. S. Department of Agriculture and the Civil Service Commission have issued warnings against a number of so-called institutes which purport to prepare men for the civil-service examination for forest ranger by means of correspondence courses.

From the standpoint of the public interest, the most objectionable feature of the advertisements issued by these concerns and of the courses themselves is the misleading picture of the Forest Ranger's job, which they present and the suppression in their advertising literature sent to prospective students of certain facts, which if known, would discourage the recipient from taking the course. The civil service commission believes it is not practicable to give through correspondence a valuable forest ranger training course, and that any advertising of a course in preparation for the forest ranger examination given through correspondence is essentially fraudulent.

A number of correspondence schools are named in the protesting bulletins, but these should not be confused with ranger courses given by some of the leading colleges and universities of the country, all of which courses require resident study.

C. R. Gibbs with Bagley & Sewall

It is announced that Charles R. Gibbs, who since 1916 has been connected with the Ryther & Pringle Company of Carthage, N. Y. has accepted the position of sales engineer with the Bagley & Sewall Company of Watertown, N. Y. Mr. Gibbs will begin his new duties at once.

Mr. Gibbs holds the degree of Bachelor of Science in Mechanical Engineering from McGill University in Montreal. He is a member of the American Society of Mechanical Engineers and the Engineering Institute of Canada. He also holds a New York State professional engineers license.

While connected with the Ryther & Pringle Company, Mr. Gibbs has been associated with the industries in Northern New York and has handled many of the engineering problems connected with their mechanical departments.

The Quality Park Envelop Co., St. Paul, Minn., and the McGill Paper Products Co., Minneapolis, Minn., consolidated, Feb. 9, to form the Bigelow-McGill Company of St. Paul, with a capital of $1,000,000. The new company will operate both plants in the Twin Cities, manufacturing paper and cloth bags and other specialties and novelties.

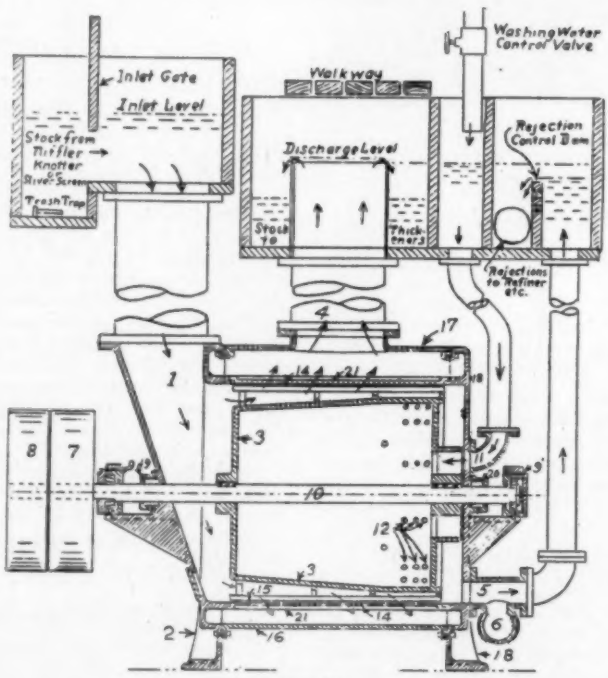
APMEW Timken Universal Screen

for

Paper and Pulp

17 Sold in Europe, Canada, and U. S. A. during last 6 months of 1928.
5 Sold in Mexico, Japan, and U. S. A. in first month and half of 1929 Produces finest quality Paper and Pulp.
70 tons daily production groundwood,
50 tons daily production sulphite,
65 tons daily production soda, with .065" plates, 25 HP consumed for these productions.
.3% to .7% screening consistency of groundwood Tailings under control.

No mixing of air. No foaming. No lumps. No spilling. No shower pipes.



The APMEW Screen.
Patented and Patents Applied for.

May we assist your Company to increase its earnings?

ASK Us.

American Paper Machinery and Engineering Works

Glens Falls, N. Y.

Canadian Manufacturer—Paper Mill Equipment Limited, 413 Drummond Bldg., Montreal, Que.

European Manufacturers—A/B Karlstads Mekaniska Verkstad, Karlstad, Sweden.
J. M. Voith Co., Heidenheim, Germany.

Pulp Screens - Centrifugal Stock Pumps - Rotary Sulphur Burners

The Month at Washington

WITH the adjournment of Congress March 4th the docket was packed and jammed with legislation clamoring for attention, but it is expected that the halls of Congress will not long remain silent and that the click of the gavel will soon again be heard, following the call of a special session of the 71st Congress to continue the work and to pass much needed legislation.

One bill introduced in the closing days was H. R. 17123 by Congressman Dickinson of Iowa, who would give Iowa State College at Ames an appropriation of $150,000 for the erection of buildings and equipment to make experiments on the physical and chemical properties and the utilization of agricultural waste products such as cornstalks, broomcorn stalks, crops, etc., for papermaking and other purposes.

The bill (H. R. 10287), known as the National Stolen Property Law, was reported out of the Committee and put on the calendar, but didn't make the grade to the point of reaching the President's signature. This law would prohibit the sending and receiving of stolen property through interstate and foreign commerce, and includes property of all kinds, whether negotiable notes, checks or physical property such as motor trucks and automobiles. Heavy fines and imprisonment follow conviction under this bill. It strikes at goods stolen from railroad cars, and any stolen booty.

Congressman Larsen put a bill on the docket (H. R. 17012) to increase the penalties in the case of violations of certain antitrust laws by directors, officers or agents of corporations. The fine is increased from $5,000 to $25,000 in one case and in another to not more than $100,000, with imprisonment of up to 5 and 10 years.

An investigation of alleged attempts to establish a monopoly in the supply of newsprint to publishers of small daily and weekly newspapers, was approved by the Senate Committee on Agriculture (S. Res. 292).

A supplemental appropriation of $100,000 to buy paper for the new small-sized paper money was asked by the Treasury Department from Congress, due almost entirely to an underestimate of the cost of producing the new small currency notes, and full production is however underway with a view to their initial issue next July. For the small-size currency a new distinctive paper was adopted and printing from new stock not properly seasoned became necessary.

The Federal Trade Commission in its report on open price associations to the Senate requested power to compel the return of statistical data needed from all manufacturers and dealers in order to insure satisfactory and accurate trade statistics for the Bureau of the Census. Institution of a licensing system to give the trade association a definite place and responsibility in the social order was also urged. The Senate has not however taken any action on these and other recommendations.

The special session of Congress will devote its time principally to tariff-revision and farm-relief legislation. The House Ways and Means Committee has been holding extensive hearings on tariff revision, running thru every schedule, and hearing every industry, with a view to redrafting the present tariff law. Several days were allotted to the paper schedule, and any readers interested may procure printed copies of these hearings upon application to the Committee.

Paper producers generally sought increases in the tariff rates. In a general statement presented on behalf of the paper and pulp industry, increases in 21 rates and no changes in 51, in Schedule 13 of the Tariff law, covering paper and paper manufactures, were asked. Clarification of several parts of the schedule, to prevent importations intended to be dutiable from coming in duty free or at lower duties than were in mind when the present law was enacted, was also asked. No change was asked in the free list status of newsprint, but mention was made of book paper as being classified as newsprint paper. For complete details of the hearings write for your copy today.

Paper Exports—Have you procured your copy of the report just issued by the Department of Commerce concerning U. S. paper exports during 1928? Paper exports for the first time since the world-wide business depression in 1920-1921, reached and passed the thirty million mark. Compared with 1927, exports represent an increase of 15 per cent, and with the 5 year average an increase of 20 per cent. Writing papers recorded the biggest advance.

Trade-Mark Convention—The Pan-American Trade Mark Conference which met in Washington last month drew up a formal convention for the protection of trade-marks among the American states, and agreed on the establishment of a Bureau of Registration, also defining unfair competition in the compact. Representations of national emblems and notations offending to public order or morals are prohibited. Under this new convention, every trade-mark that is duly registered and protected in one of the contracting states, is equally protected in all of the other contracting states, subject to certain formal requirements established by domestic legislation. Fees for inter-American registration of trade-marks is fixed at $50 to the Bureau, with $15 additional for each of the countries in which registration is sought. The various countries will be requested to adopt legislation fixing $15 as the amount to be paid to them for such registration.

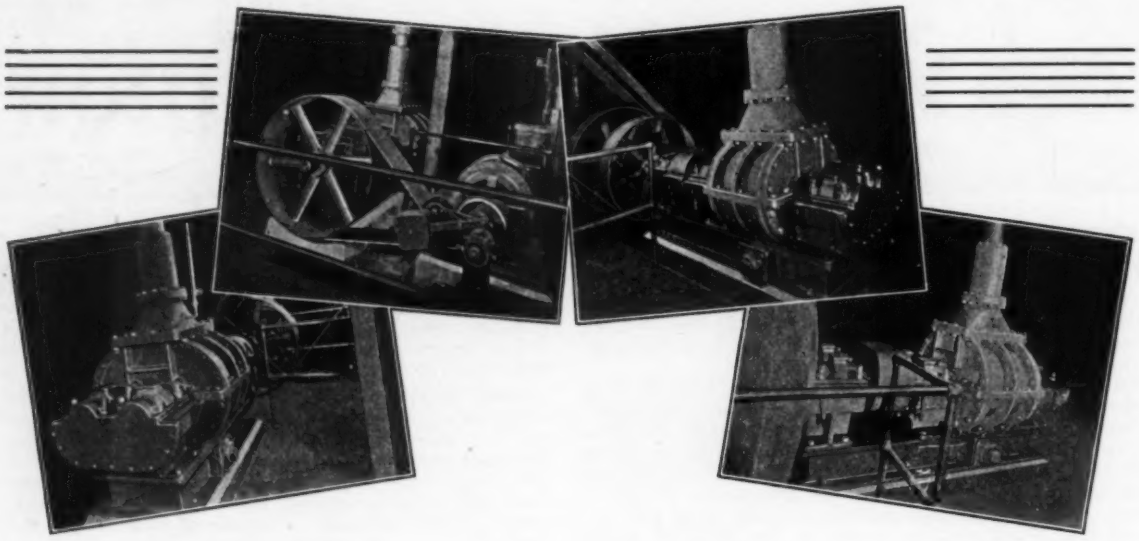
Regulations in Paper Board—Seventeen rules of business practice adopted by the paper board industry have been acted upon by the Federal Trade Commission, ten rules governing business practices being affirmatively endorsed by the commission. Seven resolutions were also acted on favorably. Three branches of the paper industry were affected: manufacturers of paper board, with 65 per cent of the tonnage; manufacturers of corrugated and solid fiber boxes, with 73 per cent in tonnage, and manufacturers of folding boxes representing 40 per cent in tonnage. This percentage of acceptance enabled the Commission to approve the rules.

Recent Customs Decisions—The Treasury Department has just issued Vol. 54, Customs, being a complete index of all treasury decisions under the customs, internal revenue and other laws, for 1928, obtainable upon request.

Surface decorated paper was the subject of a recent tariff dispute, on which duty was levied at 4½c per pound and 17 per cent ad valorem, and the importer contended that it was only dutiable at 4½c per pound under the provisions of par. 1305. The U. S. Customs Court in a decision just handed down sustained this contention (Keller Dorian Paper Co., No. 307519-G).

Ground wood pulp, white wood pulp boards, were claimed entitled to free entry under par. 649 of the tariff act of 1913 by the importer, and the Customs Court also sustained this protest in another decision (W. J. Byrnes & Co., 153271-G).

In Crown Willamette Paper Co. vs. U. S., (No. 2946), the U. S. Court of Customs Appeals handed down a decision (T. D. 43187) that the context of the paper paragraphs in the tariff act of 1922 and other acts, together with the history of the legislation, indicates that Congress when using the term standard newsprint paper intended to so re-



Positive Suction—Positive Results

There is no doubt in the minds of engineers, salesmen and users of Connersville Cycloidal Pumps about the positiveness of suction created by these pumps. It is acknowledged by all who have had any experience with the pumps.

This positive characteristic is due to the action of the impellers which displace a definite volume of air or liquid each revolution. Since this volume must be drawn in through the inlet, a suction is created which is applied to many purposes.

In paper and pulp mills, this positive vacuum means quicker, better and more positive results on suction rolls, flat boxes, dryers, felt conditioners, filters or any process using suction.

Connersville Cycloidal Vacuum Pumps may be obtained with various arrangements for application of power,—for drive from line shaft —individual motor on short centers—direct motor drive—whichever coordinates with your plant layout.

Bulletin 20B describes these pumps and lists capacities. A study of the information in the bulletin will explain more completely why the Connersville Cycloidal Vacuum Pumps can cause dependable, positive results.

THE CONNERSVILLE BLOWER COMPANY

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Blowers * Gas Pumps * Meters * Cycloidal Pumps

strict the term in meaning as to apply only to that form of print paper upon which newspapers are printed, and accordingly, the importation known as side runs, cut from standard newsprint paper, but too narrow for use for newspaper purposes, is dutiable as printing paper under par. 1301, rather than free of duty as standard newsprint paper under par. 1672.

Paper boxes, classified at 35 per cent ad valorem under par. 1313, tariff act of 1922, as manufactures of paper not specially provided for, were claimed dutiable at 5c per pound and 20 per cent ad valorem under par. 1305. The Customs Court granted the contention (267795-G-8640).

Strips of paper used for packing purposes, classified at 35 per cent ad valorem under par. 1313, as manufactures of paper not specially provided for, were claimed dutiable as waste at 10 per cent under par. 1457, but the Customs Court overruled this protest (199660-G).

Paper manufactures classified at 60 per cent was claimed dutiable at 35 per cent under par. 1313, and the court sustained this protest (H. Strompf Co., No. 312319-G).

Paper testing machines classified at 40 per cent under par. 399 were claimed dutiable at 30 per cent under par. 372, and the court agreed with the contention (No. 265736-G).

Recent Publications—"Paper and Wood Pulp" is the title of a report recently released by the Census Bureau concerning its biennial census of manufactures taken in 1928 covering 709 reporting establishments engaged primarily in the manufacture of paper and paper board, and 219 in the manufacture of wood pulp. A copy of this 5-page mimeographed report may be had on request.

"Government Periodicals and Price List of Government Publications", 22d edition, is now available for free distribution by the Superintendent of Documents.

Supreme Court Decision—The U. S. Supreme Court is expected to hand down a decision shortly to fix the extent of protection of a trade name, and whether the issuance of a trade-mark extends the rights of the holder into states in which the holder has not done business under the trade mark (No. 372). The Ohio Supreme Court held that the purpose and effect of the Trade Mark Act was to protect the trade-mark rights of the registrant and owner thereof into all the states, even in advance of the establishment of trade therein, and to afford full protection to such registrant and owner.

World Convention for Publishing Statistics—The United States has signed an international convention for the publication of economic statistics. The convention provides for a minimum program of publication of statistics regarding external trade, forestry areas, agriculture, fisheries, cost of living and various other national interests. Fear had been expressed before the signing of this convention that the publication of statistics might disclose data which business men might desire to keep secret.

Foreign Trade—A very interesting mimeographed report of six pages has been released by the Department of Commerce concerning the foreign trade of the United States in 1928, also showing exports reaching the highest figure since 1920, with constantly increased demand for American manufactured articles, including paper, also showing imports larger in quantity but lower in value. A copy of this report may be had from the Division of Statistical Research of the Department on request.

Gains with Canada and China are shown, with important additions made in exports to South American countries, Japan, Mexico, Philippines, etc.

Interstate Commerce Rulings—Rates charged on wrapping paper, in carloads, from Vancouver, Wash., to San Francisco and other California points, were found not unreasonable in a recent decision by the Interstate Commerce Commission (No. 18527). Damage by reason of any undue prejudice that might have existed, was also held not proven.

Upon further hearing, a former finding in Dallas Paper Co. vs. Ark. & La. Mo. Ry., No. 17752, that the rate charged on wrapping paper in carloads from Bastrop, La., to Dallas and Wichita Falls, Tex., was not unreasonable, was affirmed.

In Jessup & Moore Paper Co., vs. Akron, Canton & Youngstown Ry., No. 20138, the Commission found that rates on wood pulp, in carloads, from Wilmington, Del., to the western termini of trunk-line territory to central territory, and to points west thereof, were not unreasonable and the complaint was dismissed.

In Luzerne Paper Corp., vs. N. Y., N. Haven & Hartford R. R., No. 20140, the Commission found that interstate rates on rosin size, in carloads, from Waterbury, Conn., and N. Y. C. to Hadley, N. Y., were unreasonable but not unjustly discriminatory or unduly prejudicial, and reasonable rates were prescribed for the future with reparation awarded.

In Albany Perforated Wrapping Paper Co. vs. N. Y., N. H. & Hartford R. R., No. 20632, the commission found that rates on wood pulp, in carloads, from Port Newark, N. J., to Versailles, Conn., were unreasonable, and a reasonable rate was prescribed for the future, with reparation.

Upon reconsideration, the Commission modified its former finding that rates on toilet paper, in carloads from Appleton, Eau Claire and other points in Wis. to Indianapolis were unreasonable, and prescribed reasonable and nonprejudicial rates for the future (No. 19328).

Internal Revenue Ruling—In Rice, Barton & Fales, Inc., vs. Internal Revenue, Docket No. 14229, the U. S. Board of Tax Appeals finds that the profit realized from a certain contract for the manufacture and sale of book papermaking machines was taxable income in the year in which the contract was made and the income received.

Employment Conditions—Employment conditions are said to be good with the prospects bright in most industries, according to statistics released by the Department of Labor on a nation-wide survey. With 1926 as the basis of 100, the following changes are shown for paper and paper products:

	Employment			Pay-roll totals		
	1928		1929	1928		1929
	Jan.	Dec.	Jan.	Jan.	Dec.	Jan.
Paper and printing	100.2	101.2	99.6	102.1	105.1	103.2
Paper and pulp	95.5	94.1	94.5	95.0	97.0	95.7
Paper boxes	94.8	97.7	92.2	97.4	105.8	97.4

Government Movies on Forestry—Twenty-eight government motion pictures on forestry were purchased by outside agencies during the latter half of 1928, including lumber associations, paper manufacturers, universities, state forestry departments, etc. These films show fire fighting, woods management, and other forestry principles and practices.

Wholesale Prices—A slight upward tendency of wholesale prices is recorded for January according to data released by the Bureau of Labor Statistics, or an increase of nearly 1 per cent for all commodities. The following changes are shown for paper and paper products, with 1926 as the basis of 100:

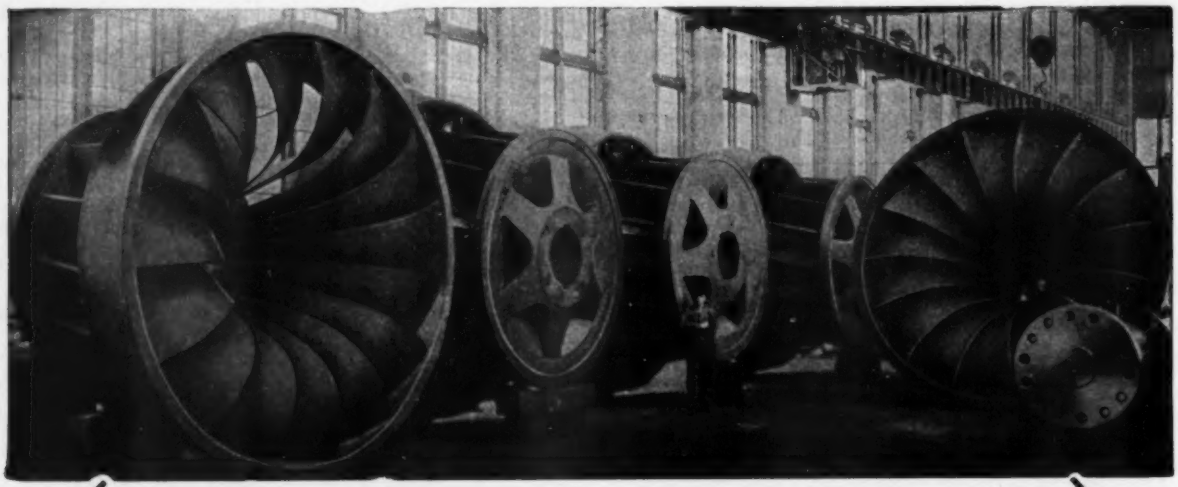
	Jan. 1928	Dec. 1928	Jan. 1929	Purchasing power of a dollar, Jan., 1929
Paper and pulp	90.9	88.6	87.8	113.9

Demurrage for C. O. D. Parcels—The post office department favors authority to place demurrage charges on all undelivered collect-on-delivery parcels, and is urgently favoring the passage of H. R. 11476 which was passed by the House and is before the Senate. This procedure is necessary to reduce the overtaxing of post office space and the Department's indemnity liability.

Business Expansion of Credit—Factors which forced money rates upward throughout 1928 are still at work says the Federal Reserve Board in a report on a survey of business conditions, with money rates being maintained to the disadvantage of commercial needs. A copy of the report may be had by interested parties on request.

Canadian Sulphides—Shawinigan Chemicals, Ltd., is undertaking the extraction at Shawinigan Falls, Quebec, of sulphur from sulphide ores, and it is possible that Canadian sulphides may shortly supply local paper plants, says an American trade commissioner at North Bay, Canada. Large deposits of these sulphides are said to exist in the Abitibi and Rouyn mining districts, both of which offer comparatively short freight hauls to pulp mills at Iroquois Falls, Smooth Rock Falls and Kapuskasing.

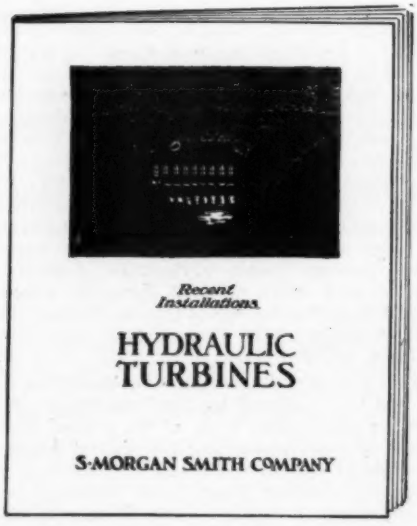
Billboard Advertising—The Department of Agriculture, Bureau of Public Roads, has just issued an interesting 5-page



Over 6,100,000 Horsepower of SMITH HYDRAULIC TURBINES in use, or now under construction

—and included in this significantly huge total, are numerous Water Power Developments for PAPER MILLS—such as Washington Pulp and Paper Co., Backus-Brooks Co., St. Croix Paper Co., Northern Electric Co., James MacLaren Paper Co., International Paper Co., etc. Backed by a continuous experience of over 50 years, plus the World's Largest Exclusive Hydraulic Turbine Works,—S. Morgan Smith Co. are prepared to supply a Turbine for any conceivable application,—from 5 H.P. to 75,000 H.P.

We shall be glad to send to those PAPER MILL OFFICIALS who are interested in the Economical Development of Water Power, a copy of our new 64 page, profusely illustrated CATALOG.



S. MORGAN SMITH CO. HYDRAULIC TURBINES

MAIN OFFICE & WORKS—YORK, PENNA.

Boston -- Chicago -- Salt Lake City -- Denver -- Portland -- San Francisco
Associated Company—S. Morgan Smith-Inglis Co., Ltd., Toronto, Canada

mimeographed report on roadside advertising signs and the laws and regulations in force in the states on this subject. In this survey of state laws governing commercial advertising signs along public highways, it was found that such laws range all the way from the most general to certain well-defined stipulations. Only 7 states are without some form of regulation—S. C., Ark., Tex., N. Mex., Okla., Kans. and Wyo. A complete copy of this report may be had upon application so long as the supply lasts. The report also shows the yearly license fee which must be paid, annual permit fee, size of signs, etc.

❖ MICHIGAN ❖

The Cost and Technical Association of the Kalamazoo Division of the American Paper and Pulp Association held an interesting meeting February 3 at the Columbia hotel in Kalamazoo. Leo Willoughby of the Bryant Paper Company, Kalamazoo, spoke on the subject "Cost Estimate Sheet".

At the meeting of the Michigan Division of the American Pulp and Paper Mill Superintendents Association held at the Park American hotel, Kalamazoo, February 21, R. N. Watts of the Cheney Bigelow Wire Works, Springfield, Mass., spoke on "Fourdrinier Wires in the Making". Mr. Watts illustrated his remarks with moving pictures showing the wires from the drawing to the packing and shipping. His address was very instructive and the meeting was voted an interesting one by all present.

The Bates Valve Bag Corp. is said to be contemplating an addition to its plant at Menominee, Mich., which will probably be 50x96 feet and include the installation of a third unit of bag machinery.

❖ SOUTHERN ❖

Plans Under Way for Greenville Board Mill

The Greenville Insulating Board Corp., has been incorporated under the laws of the State of Delaware, and will operate the new board mill to be erected at Greenville, Miss. by the Paepcke interests of Chicago, owners of the Chicago Mill and Lumber Company.

The refuse from the Chicago Mill and Lumber Company's mill at Greenville, also the small and rejected timbers from its logging operations will be utilized by the new plant as raw material. The main building is to be 140 feet wide by 540 feet long and will be located on the banks of the Mississippi river. The factory will be gas and electrically operated and employ about 200 men. The trade name for the insulating wall board to be manufactured has not been selected.

G. W. Powers of Chicago, will have charge of the operation of the new plant.

The Brown Paper Mill Co., Inc., Monroe, La., will construct an addition to its plant for recovering lime sludge. This will include building, lime kiln, tanks, conveyors, etc., and the cost will exceed $100,000. The project is being handled by Geo. F. Hardy, New York City.

Du Pont to Enlarge Tennessee Plant

Announcement is made by the Du Pont Cellophane Co., Inc., New York City, that a new unit for the manufacture of cellophane will be erected adjacent to the Du Pont rayon unit and the Old Hickory Chemical Co., at Old Hickory, near Nashville, Tenn.

This makes the fifth unit provided for since the Du Ponts began operations at Old Hickory. About 200 men will be employed to operate the new plant. The personnel of the local management has not been given out.

Paper Mill Proposed Near Huttig, Ark.

The Union Sawmill Company, Huttig, Ark. proposes to build a $3,000,000 paper mill at or near Huttig, Ark. If the recently enacted omnibus tax bill remains on the statute books of the State of Arkansas, the plant may be built two miles from Huttig, just across the state line in Louisiana.

The proposed plant will be one of the largest in the South and will be supplied with raw materials from the Union Sawmill. About 1000 workers will be employed.

The International Paper Company, New York City, is said to have acquired from the B. B. Young estate 2,000 acres of timber land in the section near Smithton and Gurdon, Ark. It is reported that the International may build a sawmill at Smithton from which billets may be shipped to its paper mill at Camden, Ark.

❖ OHIO ❖

Paper Mill Supers Meet at Dayton

Forty-nine members of the Miami Valley Division of the American Pulp and Paper Mill Superintendents Association met in regular session at the Engineers' Club, Dayton, Ohio, February 9, 1929. Robert L. Eminger, national secretary, was present and spoke of the interesting program that is being prepared for the national convention to be held at Wausau, Wis., June 6, 7 and 8, 1929.

L. E. Trotter, of the Terry Steam Turbine Company, Cincinnati, Ohio, entertained the convention with pictures of Terry turbine installations in paper mills, applied to variable drives. Mr. Trotter gave an interesting address relating the development of the Terry turbine from its earliest installation and pointed out its applicability to paper machine drives by giving the following examples of installations: 15 Beloit, 6 Rice, Barton and Fales, 6 Pusey & Jones, 3 Bagley & Sewall, 3 Black-Clawson, 2 J. Horne & Son, 2 Smith & Winchester, 1 Shartle Bros., 1 Downingtown, 1 H. C. Clark & Sons. There are a number of other installations of which complete information is not on file

B. E. Keifer of the Timken Roller Bearing Co., Canton, Ohio, gave a very instructive talk no Timken roller bearings and their application to paper mill machinery. His remarks were illustrated with moving pictures.

Improvements at Aetna Paper Company Mill

The Aetna Paper Company, Dayton, Ohio, has prepared plans for the complete rebuilding of one of their fourdrinier machines. It was requisite to construct a large building in order to put on the necessary length of fourdrinier wire, as well as additional drying equipment, and other additions to the machines.

Increased storage facilities for finished product were provided in the reconstruction of buildings and will permit of the firm carrying a heavier stock at the mill. The buildings are complete and necessary alterations to the machinery will follow soon.

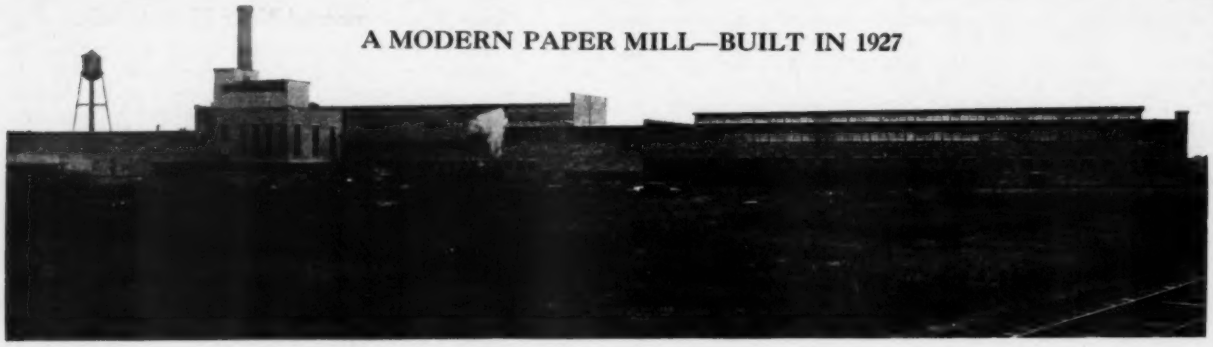
The power plant is being rebuilt, with the installation of an extraction type turbo-generator and the motorizing of a large part of the plant.

Large contracts involving the purchase of equipment have already been placed with Pusey & Jones, builders of paper machines, the Paper & Textile Machinery Company, and E. D. Jones & Sons.

Suction roll and rotary screens and various other parts, indispensable in far-reaching plans to make the Aetna Paper Company, one of the most up-to-date mills manufacturing rag content papers in the country, will be installed. It was also found expedient to spend much money in the beater room to increase the facilities there, which includes new jordans.

It is estimated that the aproximate cost of alterations and improvements will be in excess of $500,000.

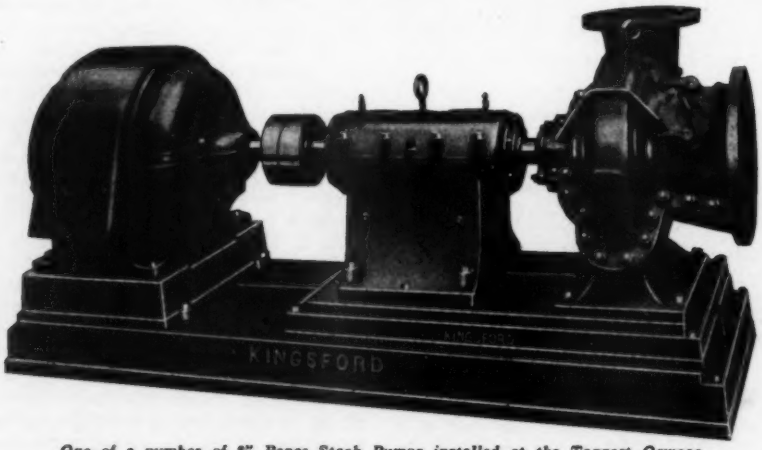
A MODERN PAPER MILL—BUILT IN 1927



PLANT OF TAGGART OSWEGO PAPER AND BAG CORPORATION

Absolute confidence has been exhibited by the Taggart Oswego Paper and Bag Corporation, Oswego, New York, in providing for the most part, centrifugal pumps for their fresh water supply, the handling of white water, stock, boiler feed and process requirements, and such installation for these purposes of—

KINGSFORD PUMPS



One of a number of 8" Paper Stock Pumps installed at the Taggart Oswego Paper & Bag Corp., Oswego, N. Y.

All KINGSFORD double suction pumps up to 10" size are made with bearing housings cast integral with the lower half of casing (machined as a unit with casing), insuring absolute and permanent alignment of bearings. Horizontal split casing provides quick accessibility to interior. Sealed bearings can be furnished in either babbitted, ball or Timken roller types. KINGSFORD patented hydraulic balancing device eliminates end thrust.

KINGSFORD multi-stage centrifugal pumps have the same construction features as listed above, same type and construction of bearings, and with either ball thrust bearing or KINGSFORD patented double acting hydraulic balancing piston.

The desirability of these features appeals to Paper Mill Operators and all of them will only be found in KINGSFORD line of pumps.

Write for further information—our 30 years of experience may be of value and profit to you.

Kingsford Foundry and Machine Works

Oswego, N. Y.

Una-Flow Engines all Types
High Speed, Vertical,
Horizontal and Marine.
Centrifugal Pumping Machinery

Internally Fired Boilers
for
Marine and Stationary Purposes
Sectional Water Tube Boilers

an

ERIE CITY STEAM UNIT

PULVERIZED COAL FIRED

NOW IN ITS

5TH YEAR

OF TWENTY-FOUR HOUR SERVICE

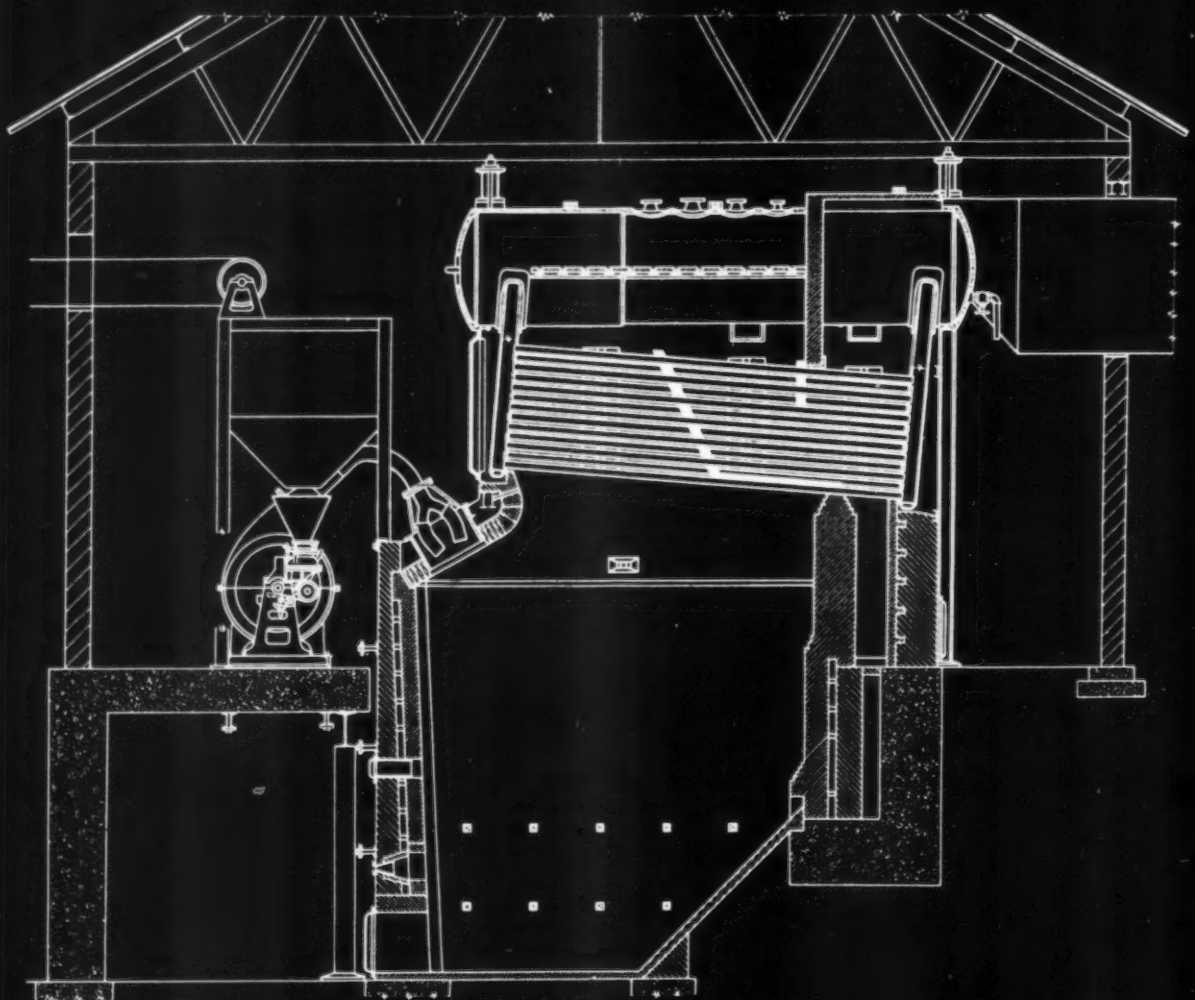
This installation shows, in comparison with the one it replaced, an efficiency 12% higher, a labor and maintenance charge 63% lower and burns a cheaper grade of coal with an annual saving of over 1150 tons.

AT THE LOCKPORT, N. Y. PLANT OF

THE FLINTKOTE COMPANY

ASPHALT SHINGLES PREPARED ROOFINGS

NEW YORK BOSTON CHICAGO



SECTIONAL ELEVATION OF A 512 H. P. ERIE CITY HORIZONTAL, LONGITUDINAL DRUM WATER TUBE BOILER BUILT FOR 180# W. P. AT THE LOCKPORT, N. Y. PLANT OF THE FLINTKOTE COMPANY. THIS BOILER IS FIRED BY A 4000# ERIE CITY "UNITYPE" PULVERIZER. THE AIR COOLED FURNACE BEING DESIGNED FOR 200% OF RATING. THIS INSTALLATION, PICTURED ABOVE HAS BEEN FURNISHING THE ENTIRE 24-HOUR STEAM DEMAND OF A LARGE ROOFING PAPER MILL FOR NEARLY FIVE YEARS.

ERIE CITY IRON WORKS

ERIE, PENNA, U.S.A.

Canadian News

Newsprint at $55.20

It has just been reported that the newsprint price agreement between manufacturers and publishers for 1929 has been signed, the price being fixed for the year at $55.20, with a 75 per cent limit on production. While the agreement was not announced in an official manner, a number of newsprint executives indicated that it was substantially correct, and Premier Taschereau, on being approached in Quebec, stated, "I have been advised that all have signed and that everything in settled." Inquiries in Montreal elicited the information that an official statement setting forth the details would not likely be forthcoming, beyond an announcement by individual companies of the price of newsprint for 1929.

A statement has been issued from the New York office of International Paper denying that any such agreement had been reached, at least as far as the company was aware, and adding that the company's 1929 prices had not yet been determined but would probably be announced early in March.

Owing to the reorganization of the Crown Willamette Paper Co., who were owners of the Pacific Mills, and to their new connection with the Pacific Steamship Co., the contract for the carriage of paper from British Columbia to California was transferred from the Canadian National Steamships to the Pacific Steamship Co., resulting in a decrease in revenue of over $300,000 for the Government line. As this paper formerly provided the Canadian National Steamships with the bulk of their southbound cargo, the situation is being canvassed with a view to finding other profitable employment for the Government boats; and if no business is secured to replace that which has been lost, the steamers will be sold.

At the annual meeting of the Canadian Paper Trade Association, held in Montreal recently, Fred W. Halls, of the Fred W. Halls Paper Co., Ltd., Toronto, was elected president. Associated with him as executives of the association are: John Martin, of Winnipeg, honorary president; Frederick Smith, of Smith, Davidson and Wright, Vancouver, first vice-president; L. P. Turgeon, of Quebec City, second vice-president; T. J. Macabe, of the Buntin Reid Co., Toronto, treasurer; N. L. Martin, honorary secretary, and Ivan Moffitt, secretary.

Bathurst Declares Dividend

At a meeting of directors of Bathurst Power and Paper Co. held in Montreal last month, a dividend of 25 cents a share on the Class A common stock was declared, payable on March 15 to shareholders of record as at February 28. Encouraging reports regarding the company's business was presented, and the feeling expressed that the company will substantially benefit as soon as conditions in the newsprint industry are stabilized. The company's second paper machine, of 80 tons capacity, is expected to be in operation by April 1.

The financial statement for the year 1928 showed that, after deducting all operating, selling and management expenses, and after making provision for depletion of timber limits at the rate of $1 per cord on wood cut, the profits for the year amounted to $411,781. After further deductions for depreciation, interest on bonds (since redeemed) and other items amounting to $290,034, there remains a net profit of $121,746.

A. R. Graustein resigned his seat on the board as president and director, and Brigadier General J. B. White was elected president, with A. E. McLean vice-president and general manager, and H. J. Webb vice-president and treasurer. The other directors are as follows: A. J. Nesbitt, P. A. Thompson, J. B. Woodyatt and G. H. Montgomery.

❖ QUEBEC ❖

Eddy Company Projects Expansion

Promises of a still further expansion of the interests of the E. B. Eddy Co. in the city of Hull were contained in a message delivered by Victor M. Drury, the new president of the company, at a welcoming banquet which was recently tendered him by prominent citizens of Hull. In his remarks, Mr. Drury conveyed his best wishes to the citizens and workers of Hull and voiced a high note of optimism for the future welfare of the city and of the company of which he is the head. Plans, he said, were now being discussed whereby the company would further assist the industrial growth of Hull by enlarging the paper plant, thus giving employment to a large additional number of Hull workers. He regretted for the sake of Hull the changing of the site of the E. B. Eddy match factory to Berthierville, Que., and explained that such a step had been found necessary on account of keen competition and to effect greater economies. Should the plans now being discussed be finally adopted, Hull would be compensated for the loss of the match factory.

C. V. Caesar, general manager of the company, subsequently stated that nothing definite had as yet been decided in regard to the new plans, but added significantly that a company naturally has to expand and advance or else drop behind its competitors.

Brompton Shows $3.56 per Share

The financial statement of Brompton Pulp and Paper Co. for 1928 shows a substantial increase in earnings. Gross operating profits before depreciation and other charges amounted to $1,655,396 as compared with $1,545,130 in 1927 and $1,240,954 in 1926. After depreciation and income tax of $585,863, there remained a balance of $1,069,531. On the present basis of capitalization, which consists only of 300,000 shares of capital or common stock, these earnings would have represented $3.56 per share as compared with current dividends of $2 per share. As a matter of fact, bond interest and preferred dividends were payable for a portion of the year 1928 and covered an amount of $364,629, while dividends of $375,000 were paid on the common stock. This left a surplus for the year of $329,902.

The balance sheet shows several important changes. The previous funded debt amounting to $4,741,000 has been retired as well as all but 29 shares of the 8 per cent cumulative preference stock. The statement shows a much stronger liquid position than a year previous, net working capital at $3,485,339 being up 42 per cent. Bank loans show a reduction of $390,000, standing at only $225,000. Inventories amount to $3,539,219 as compared with $3,120,051 in 1927. The high inventory is due to the company having nearly two years' supply of pulpwood on hand, which should practically do away with logging operations in 1929.

Building Products Earnings Increase

Earnings of Building Products, Ltd., for the year ending December 31, 1928, were well up to official estimates of $3, amounting to $2.98 on the combined A and B shares outstanding, without taking into consideration profit of $113,591 from sale of assets. The preferred stock has been called for redemption and 10,986 additional shares of the A stock are to be issued to finance this operation. In 1928, preferred dividends were earned better than seven times over.

Profits from operations are shown at $376,396, comparing with $331,737 in the preceding year. With the addition of

Putting new life into old paper machines

There comes a time in the life of engine-driven paper machines when production becomes uncertain and maintenance becomes higher. Now—there is an economical way to give the old machine a new lease on life and to effect decided improvements in operation. This is what you are sure to get: *improved speed regulation . . . more flexible control . . . better product . . . less maintenance.*

Full-automatic control for the motor below, with Westinghouse carbon-pile voltage and speed regulators.

250-kw. synchronous motor-generator for furnishing power to the motor shown below.

300 h.p. adjustable-speed d.c. motor, driving a paper machine.

This is how to do it:

By replacing the old engine with Westinghouse single-motor drive, including adjustable speed control and automatic speed regulation, you will thus be able economically to improve your machines that are too old to warrant sectional drive. This will assist in obtaining the more uniform paper weights that are now demanded for modern high-speed printing presses. Further information on request.

CANADIAN WESTINGHOUSE CO., LIMITED
GENERAL OFFICES—HAMILTON, ONTARIO.
Sales Offices and Repair Shops in all Principal Cities

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Serves the paper industry with . .

Automatic Substations
Capacitors
Circuit-breakers
Condensers
Gear Units
Insulating Materials
Lighting Equipment
Mazda Lamps
Micarta Gears
Motors and Controllers
Panelboards
Relays
Safety Switches
Speed Reducers
Stokers
Switchboards
Transformers
Turbines
Voltage Regulators

surplus of $402,269 and $113,591 profits realized from the the sale of properties and adjustment of reserves, etc., there was available for distribution $892,256. Dividends amounting to $49,000 were paid on the preferred stock and $142,818 on the common, and after deduction of $56,972 for premium and expenses in connection with the redemption of preferred stock, total credit balance to be carried into the new year was $643,466. Working capital was increased from $1,545,619 to $1,739,815 and the ratio of current assets to liabilities is over 8 to 1. Total assets are valued at $2,934,597, of which $1,839,100 were current.

Dominion Engineering Increases Dividend

At a meeting held in Montreal on February 1st, directors of the Dominion Engineering Works announced a further increase in the dividend rate by declaring a quarterly dividend of $1 per share for the quarter ended March 30th. The stock is thus placed on a $4 annual rate as compared with the $3 paid previously. The directors also considered the financial statement figures for 1928, which is expected to show a substantial improvement over the $4.29 per share earned on the stock in 1927.

The company has participated in a generous manner in the huge expansion programs under way in the hydroelectric and paper industries and has a considerable amount of work on hand, including two 234-inch news machines, for the mill being constructed by the Mersey Paper Co. in Nova Scotia, two 226-inch news machines for the Dalhousie, N. B., mill of International Paper Co., and a pulp drying machine equipped with Minton vacuum drier for the Brown Corporation at La Tuque, Que.

A recent and constructive development in the affairs of the company was the virtual taking over of the business of Charles Walmsley and Co. (Canada), Ltd., and since then part of the plant of this company was leased to the newly formed Canadian Pratt and Whitney Aircraft Co., an airplane engine manufacturing organization, whose strong board includes the president of Dominion Bridge Co. and its subsidiary Dominion Engineerng Works.

Good Year for Donnacona

The first annual statement issued by Donnacona Paper Co. since the reorganization last year, when control was acquired by Price Bros., shows a substantial increase in gross profits, but heavy write-offs for depreciation and interest made a material reduction in net earnings applicable to the common stock.

Profits for the year were $869,762 compared with $549,363. Deduction for bond and debenture interest amounted to $590,704 and allowance for depreciation and depletion of timber limits was $216,687, a total of $807,392, as against total deductions in the previous year of $19,021. This left net profits of $72,370, equivalent to 41 cents per share on the 150,000 shares of common stock outstanding. Net earnings for 1927 were shown at $530,342, equal to $3.55 a share on the present capitalization. A strong liquid position is revealed in the balance sheet.

In their report the directors state that during the year certain improvements have been made at the mill which have tended to increase the capacity and consequent economy in operation.

Bertel Sjöberg, manager of the Finish Paper Mills Association, of Helsingfors, Finland, and Jay Madden of Parsons and Whittempre, New York, his traveling companion, were entertained at luncheon at the Mount Stephen Club, Montreal, by the Canadian Pulp and Paper Association early last month. Mr. Sjöberg gave an interesting account of the methods by which the Finnish output of newsprint is marketed through a central selling organization which comprises all the Finnish mills with one or two exceptions. In view of the efforts of the Canadian manufacturers to find some means of pooling their interests, the remarks of Mr. Sjöberg were very pertinent and provoked not a little interest. Before leaving for New York he paid a visit to some of the paper mills in the Three-Rivers district and expressed himself as highly impressed with what he saw there. He was amazed at the speed attained in the operation of the big machines in the Canadian International Paper Co.'s plant which he said far exceeded anything of the kind in his own country.

Good Showing by Rolland Paper Co.

Rolland Paper Co., Ltd., manufacturer of high-grade bond, writing and ledger papers, has just released its first financial report, for the seven months ended December 31st, 1928. Although the Rolland business has been in operation for nearly half a century, its St. Jérôme mill being the first to produce writing papers, in Canada, the public interest in its capital stock dates only from June, 1928, when the present company was formed.

Earnings for the seven months period covered by the report, after operating expenses but before interest, depreciation, and income tax, were $256,607, or a monthly average of approximately $37,000, and equivalent to $443,300. This indicates a substantial growth in the company's business during 1928, as in the circulars issued by Royal Securities Corp. covering the public financing last June it was estimated that earnings, on the same basis for the complete twelve months, would be approximately $400,000, and the 1927 earnings were shown as $331,353. Earning power is expected to be materially increased from now on, as an additional 86-inch fine paper machine is coming into operation at the St. Jérôme mill. Funds for the installation of this machine were provided out of the financing done last June.

The balance sheet as at December 31, 1928, shows the company to be in a satisfactory liquid position, with current assets in the ratio of 4.5 to 1 of current liabilities, net working capital of $757,166, and no bank loans outstanding. New construction at St. Jérôme is reflected in a net addition of $387,964 to fixed assets during the period covered.

The Bates Valve Bag Co., Ltd., is building a one-story extension to its factory at Cap de la Madeleine. The new building will be 240 by 80 feet, constructed of brick, with all-steel frames and window sashes. For the present the company will use it for storage and of finished cement bags, which will give it a more uniform manufacturing condition.

Nine logging dams in Montmorency County, eight of them on tributaries of the Montmorency River and one on Brulé River, a tributary of Snow River, are being constructed by the Anglo-Canadian Pulp and Paper Mills, of Quebec City, in preparation for the spring drive.

The two new machines of the St. Lawrence Paper Mills, Three-Rivers, are now in operation, and are being tuned up. It is expected that they will attain their rated capacity of 75 tons per day by the end of this month, thus increasing the capacity of the mill from 300 to 450 tons per day.

Frank I. Ritchie, manager of the Wayagamack Pulp and Paper Co., has been elected president of the Three-Rivers Board of Trade at a recent meeting of the directors. Mr. Ritchie has a wide knowledge of the lumber industry as well as of the pulp and paper industry, and has also served as manager of the bank at La Tuque.

Gatineau Power Installs Two New Generators

Gatineau Power Co., controlled by Canadian Hydro-Electric Corp., Ltd., a Canadian International Paper subsidiary, has started the fourth 24,000-horsepower unit at its Farmers hydroelectric plant, and the fourth 34,000-horsepower unit at the Chelsea plant. These two new generators raise the total installed capacity of these two plants to 232,000 horsepower.

The total capacity of the plants of Gatineau Power Co. is now 562,600 horsepower, installed and in process of installation, slightly greater than the developed power on the American side of Niagara Falls. Of this, 439,000 horsepower is on the Gatineau River, and the balance, 123,600

Charles Walmsley & Co.
(CANADA) LIMITED

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Continuous Breaker Beaters
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Cast Iron Stuff Chests
Wet Machines

PAPER MAKING MACHINES—ALL TYPES

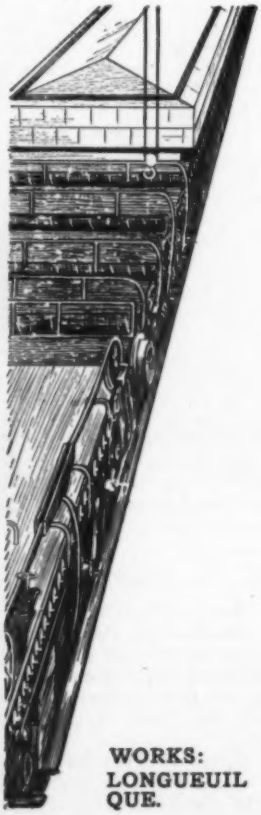
Minton Vacuum Dryers
Sulphite Drying Machines

Patent Removable Fourdrinier
Cylinder Moulds
Vacuum Pumps
Walmsley Showers
M & W Showers
Walmsley Wire & Felt Guides
M & W Wire & Felt Guides
English Reels

Pope Reels
Turnover Reels
Upright Reels
Vickery Reels
Unwinding Stands
Winders—2-Drum
M & W 4-Drum Winders

Drive Units:
Bevel Gear) Totally
Worm Gear) enclosed
Friction Clutches
Flexible Couplings

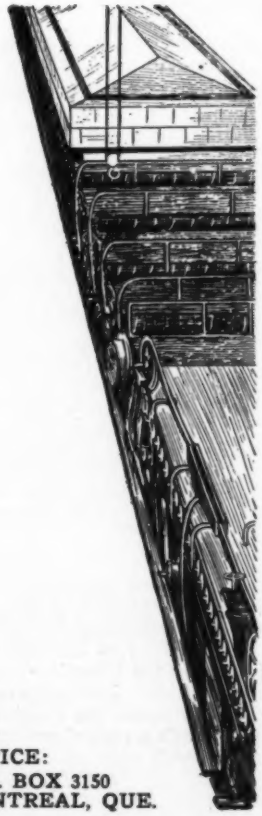
Damping Machines
Super Calenders
Layboys



PAPER MACHINE ROLLS

Table Rolls
Wet Felt Rolls
Dry Felt Rolls
Chilled Iron Rolls

Press Rolls
Bronze Covered
Rubber Covered
Granite



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SPECIALTIES—
Reconditioning existing machines.
Regrinding Rolls of all descriptions.

Charles Walmsley & Co.
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P. O. BOX 3150
MONTREAL, QUE.

horsepower, is in the hydroelectric developments of the company on the Ottawa River and its other tributaries.

Frank R. Hyatt who has been assistant manager at the Three-Rivers mill of International Paper since 1925, has been appointed manager of the same company's mill at Berlin, N. H., and will leave in the near future to assume his new duties.

MacLaren Awards Contract for Mill

The James MacLaren Lumber Co., of Buckingham, has awarded the Foundation Co., of Montreal, the contract for the construction of a 250-ton newsprint mill and a 75-ton sulphite mill on its property at Buckingham Junction. The mills will cost in the neighborhood of $6,000,000 and will furnish 500 men with employment. Preliminary work has already been started, and it is expected that it will be completed by the late summer of 1930; but owing to the present situation of the newsprint industry, the company has agreed that it will not manufacture newsprint until the fall of 1930. Dominion Engineering Works have secured the contract for the two 234-inch news machines.

Power for the mills will be derived from the High Falls power development of the MacLaren Company, which is now under way and where an initial power supply of 90,000 horsepower will be generated, and provision has been made for the installation of another 30,000-horsepower unit when required.

❖ ONTARIO ❖

To Insure Perpetual Pulpwood Supply

Known briefly as the "Pulpwood Supply Act", an exceedingly important piece of legislation has been brought before the Ontario Legislature by Hon. Wm. Finlayson, Minister of Lands and Forests. Under the bill, the Government seeks to establish a perpetual supply of pulpwood for the paper mills of the Province. Under the provisions of the bill, the Department will establish a check on the pulpwood consumption of the province and, after a general survey, take steps to place the industry on a sustained yield basis. The measure provides that companies must submit to the Government detailed statements showing not only their financial position, but the pulpwood holdings that they now have under control, and the amount of pulpwood used from 1927 to 1928 inclusive. On receipt of these statements, the Government will study them individually and submit them to the Forestry Board with the idea of devising some plan to place the pulpwood supply of the Province on a sustained yield basis. If it is considered necessary, the Province will be divided into sections for the working out of the plan. The bill grants the right to the Minister to control cutting rights in any form.

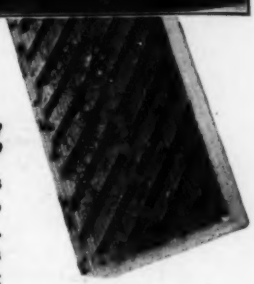
This act is supplemented by the "Provincial Forests Act", under which provincial forests will be established and the latest and best European forestry practice employed so that they may be placed in perpetuity on a sustained yield basis. From seven to ten great areas in Northern Ontario, including the present Temagami Reserve, with an area of 5380 square miles; the Mississaugua Reserve, with roughly 4800 square miles; the Nipigon Reserve, with 6000 square miles and the Quetico Park Reserve, with 1720 square miles, will be designated at "Provincial Forests" and given over entirely to reforestation on a gigantic scale under the direction of expert foresters. Other areas in the North will be surveyed and the most suitable for reforestation purposes will be selected by departmental foresters and set aside in accordance with the terms of the new legislation.

Justice Jeffrey, Toronto, has made an order discharging G. T. Clarkson as liquidator of the Franquelin Lumber and Pulpwood Co., the assets of the company having been purchased for $1,500,000 by the Ontario Paper Co., the only creditor. The statute requires that the books of the company remain in the hands of the liquidator. The purchasers, how-

Full-Fibre Pulp

with

HELIN
Beater Filling



IT'S similar to basalt lava in its action, but it is not nearly so costly and it wears far longer. Hydrates pulp twice as fast as steel knives and does it without cutting the fibres. This is particularly important when strong long-fibred paper is wanted—so it is especially suitable for Kraft and wrapping paper. Made simply of cast iron with a porous lava-like surface. Beats thoroughly and quickly—and is made to fit any beater.

Bigger Production at Lower Cost

In actual tests—where machines, pulp and all conditions except the Filling were exactly the same—Helin Beater Filling produced *twice as much* hydrated pulp in the same length of time as did the steel knife filling.

Thus the capacity of the beaters is increased 100% and the power per ton of paper is reduced more than 30%. Add to this your better quality of pulp and you have real profitable economy.

To increase your volume—just equip the beaters you have with Helin Beater Filling.

The Famous U-BAR Barking Drum

Built to fit the job—Big production results from the special design and is insured by rugged dependable construction. The specially designed U-BARS of high carbon steel are joined securely to heavy ship channel rings with *multiple-rivet* joints —thus effective, clean barking.

Smooth rotation is the result of chain suspension with guide-rolls, sprockets and spring takeups of shock absorbers—hence *faster* rotation and BIG PRODUCTION.

Full Details Sent on Request

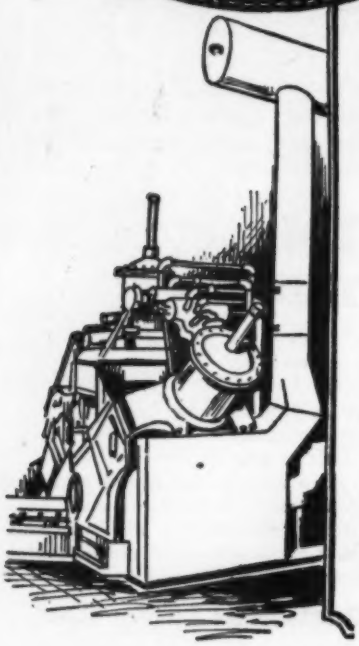
Fibre Making Processes, Inc.

CHICAGO, U. S. A.

Canadian Barking Drum Co., Ltd., Toronto

BARKING U-BAR DRUMS

ROSS Grinder Exhaust SYSTEMS



Fog! Wet Floors! Workers Blinded

All Eliminated!

Upper photograph shows the boxes removed from two grinders during the operation of the grinder room.

The lower photograph shows the same grinders after the boxes were replaced and the exhaust system put in use. There is no longer any excuse for poor ventilation or an extravagant system of heating and ventilating in a grinder room.

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ROSS ENGINEERING OF CANADA, LIMITED

NEW BIRKS BLDG., MONTREAL

ROSS SYSTEMS

HEATING—VENTILATING—DRYING

ever, representing that it was necessary to have the books of the company in order to carry on business, his Lordship made an order to that effect. The Ontario Paper Co. is required to give an undertaking to return the books to court any time they may be needed.

Coating Mill Moves to Georgetown

After operating at New Toronto for nearly forty years, Ritchie and Ramsay, Ltd., coated paper manufacturers, which was recently taken into the merger known as the Alliance Paper Mills, Ltd., is closing its plant and moving the business to the Georgetown plant, which is also now part of Alliance Paper Mills. No official announcement concerning the change has as yet been made, but employees have been notified and some of the machinery has already been moved.

The plant is about the oldest industry in New Toronto and is considered as being the one which built up the town in early days. One of its unique features is that the employees are nearly all old timers. The oldest employee, W. J. Hennessey, has been with the firm since it first started, while the most recent addition to the staff was taken on five years ago.

Novel Method of Salvaging Pulpwood

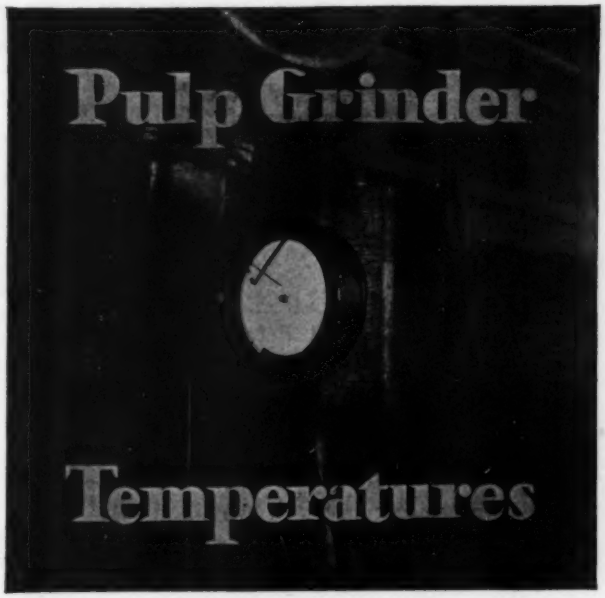
In the developing of electrical power by the Seine Power Development Co., a large tract of land lying south of Savanne has become flooded. The Department of Lands and Forests, in conformity with its conservation policy, has instructed the Seine Power Development Co., a subsidiary of the Backus interests, to take off all spruce pulpwood which is now standing in about four feet of water. There are about 20,000 cords which can be salvaged before rot sets in.

The Don Clark Co., of Port Arthur, has secured the contract for the taking off of this pulpwood. Seven small camps have been built on the flooded area and, owing to the scattered nature of the pulpwood, the camps have to be moved to new locations each month. To save the expense of rebuilding every month, a system unique in woods operations has been devised: each camp is built on timbers constructed into what is really a huge sleigh; when one flooded spruce swamp has been cut out, a four-horse team is hitched to the camp, which is easily and quickly transported over the ice to the site of the next operations.

Expansion of the box manufacturing business in Toronto is illustrated by the purchase of the former plant of Thompson and Norris, who were manufacturers of corrugated paper boxes, by the Canadian Wirebound Box Co. The deal means taking over a building providing 80,000 square feet of additional space and over half an acre of vacant land, as well as a railway siding which will accommodate fifteen cars. The purchasers plan to double their capacity and output and enlarge the office space to the west by building an addition on a vacant parcel, 30 by 72 feet.

Charles R. Dodge, for the past five years chief electrician at the Great Lakes Paper Co., Fort William, left recently to take a new position with the Mersey Paper Co., in Nova Scotia, at the head of which is Colonel C. H. L. Jones, former vice-president of the Spanish River Pulp and Paper Mills, and now president of the Canadian Pulp and Paper Association. During the five years that Mr. Dodge resided at the head of the lakes he was in charge of the entire installation of electric and power facilities for the Great Lakes Paper Co. Previous to his departure he was entertained by the staff of the company and the Backus-Brooks Co., and presented with a gold watch.

Arthur H. Hobson, who for some years has been connected with the sales staff of the Howard Smith Paper Mills in Toronto, has been appointed assistant sales manager of the company, with headquarters in that city. He will look after the firm's Ontario business as assistant to George Davidson, sales manager of the company at Montreal. R. B. Hall,



American Recording Thermometer on a pulp grinder, Canadian International Paper Co., Three Rivers, Quebec, Canada.

If a record is kept of pulp grinder temperatures, the stones may be maintained at a uniform temperature. Just enough cooling water may be admitted for the best grinding and to prevent breakage of stones.

This is only one use of American Recording Thermometers to increase the efficiency of paper mills.

Specify Catalogs Desired

Recording Thermometers.....H-41
Glass Thermometers.....F-41
Dial Thermometers.....G-41
Recording Gauges.....E-41
Sulphite Gauges.....A-41
Paper Machine Tachometers...O-41
Temperature Controllers.....R-41
Ashcroft Paper Tester.....C-41
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Subsidiary of Manning, Maxwell and Moore Inc.
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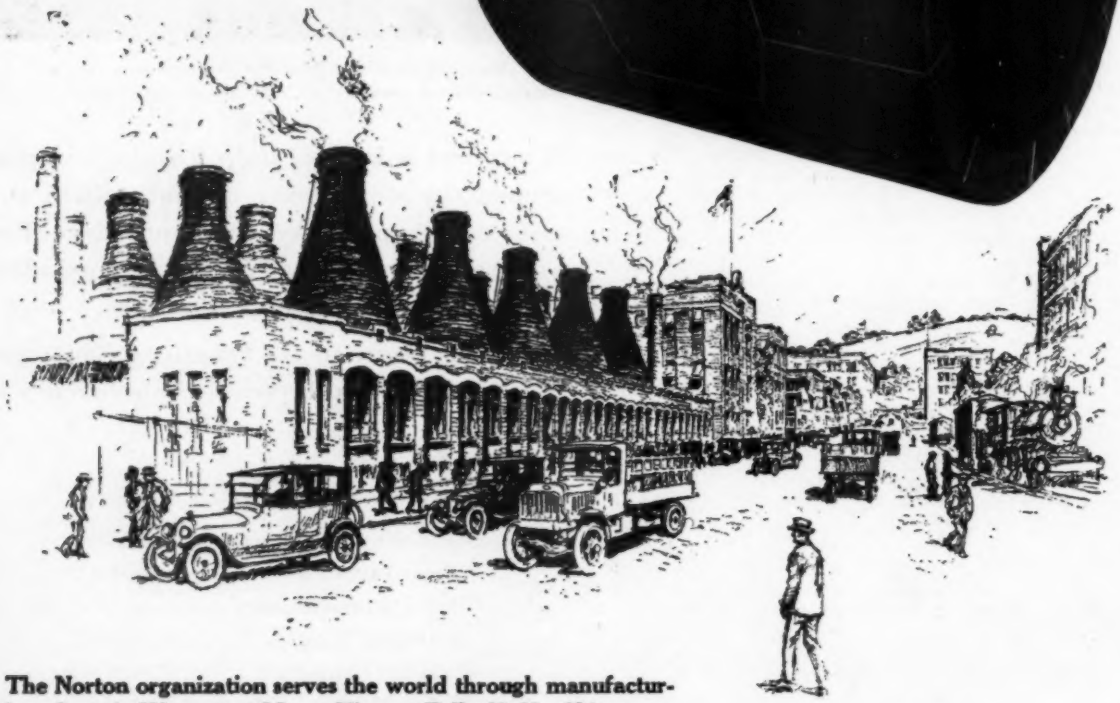
NORTON PULP STONE

From the production of the abrasive to the assembling of the finished segments, every step in the manufacture of the Norton Pulp Stone is scientifically controlled.

The production requirements of each wood pulp mill dictates the proper grit size, hardness and structure. Every Pulp Stone therefore is made to meet specific requirements and furthermore, each succeeding stone can be duplicated exactly.



The Norton organization serves the world through manufacturing plants in Worcester, Mass., Niagara Falls, N. Y., Chippawa, Can., Bauxite, Ark., Hamilton, Can., La Courneuve, France, and Wesseling, Germany.

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Canadian Trade Now Supplied from Canadian Plant

Grinding Wheels
Grinding Machines

NORTON
PULP STONES

Refractories - Floor
and Stair Tiles

the former Toronto office manager, has been appointed sales manager of the Canada Paper Co., which is operated by the Howard Smith organization, and which is opening offices in both Toronto and Montreal. Mr. Hall will have his headquarters in the Toronto office. Another appointment to the Toronto office is that of F. G. Hunt, who was formerly with the Alliance Paper Mills, a company associated with the Howard Smith Interests.

Freeman W. Elliott, who for the past several years has been chemist of the Canadian Cellulose Co., a subsidiary of Howard Smith Paper Mills, has been appointed chief chemist of the Cornwall Division of the parent company.

Wireless Improves Forest Protection

Ontario Provincial Air Force planes will be equipped this year to wireless bush fire reports to their headquarters from any distance up to 400 miles. This distinct advance in the conservation of Ontario's forest wealth is due chiefly to the enterprise of R. N. Johnston and Charles Ward, two young forestry branch engineers, whose experiments with radio wireless during the past two years have, from the point of view of the results obtained, not only astounded themselves and their immediate superiors, but have so attracted the attention of the outside inventive world that they are to have whatever co-operation in perfecting their experiments that the Bell Telephone Laboratories at New York can, from time to time, furnish them.

Forestry Branch officials are elated over the new radio equipment, claiming that its utilization by the planes should mean a great saving of time in reporting fresh fire outbreaks and in rushing in pump crews to fight them. At the present time the Forestry Branch operates some fourteen wireless stations in Northern Ontario, four of which have been running all this winter as the sole means of communication between the far-flung mining centers and the outside world.

Investigate Government Timber Sales

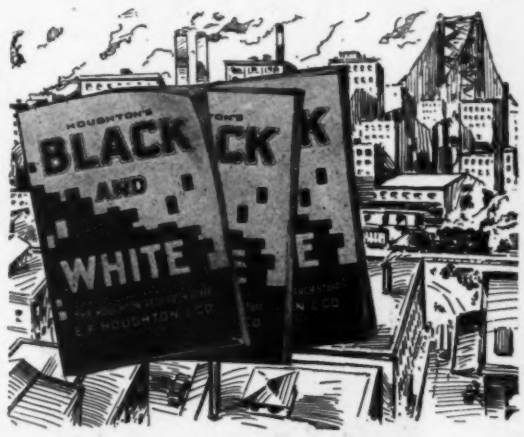
The Ontario Government's system of selling pulp and timber limits in the Province and the number of acres sold by the Department of Lands and Forests under the direction of the Hon. Wm. Finlayson will come before the Legislature in the near future as a result of a resolution brought before the House by the member for North Bruce.

As a result of information secured by this means last year, some surprising data which led to the condemnation of the Government's policy by the Opposition members of the House was uncovered. It is probable that another attack will be made on the Government for its attitude in these matters by Liberal members at this session. It was found last year that in the majority of cases where timber limits were sold only one tender had been received. The Opposition declared that this was the case where the Government had let it be known that no other company's bid would be considered, and that the limits were not actually sold by tender but by the will of the Government.

The annual statement of Provincial Paper, Ltd., for the year ended December 31, 1928, reveals profits from manufacturing operations of $1,138,330, which, with sundry revenues, brought the total up to $1,140,230. This, with $72,927 brought forward from the previous year, made the amount available for appropriations $1,213,157. Bond interest, etc., absorbed $286,282; reserves for depreciation, $450,000; reserves for bad debts, $10,000 and for income tax $35,000, leaving a net profit of $431,775. Preferred dividends absorbed $245,000, leaving a surplus carried forward of $186,775. Net available for common for the year was $113,748, equal to $1.13 on the 100,000 shares of no-par-value outstanding. The balance sheet showed current assets of $2,568,238, against current liabilities of $526,151, making the net working capital $2,042,087.

It is learned that milling companies throughout Canada are now considering adopting kraft paper containers for

The Reason Why Paper Men Read "BLACK AND WHITE"



EACH edition of Houghton's "BLACK AND WHITE" (General) contains authoritative copyrighted articles of vital interest to those engaged in the paper industry.

The entire Houghton organization, with its world wide activities, its elaborate department of records, modern research laboratories, and international field force, collaborates with the editorial staff of "BLACK AND WHITE," famous paper experts, and executives of nationally known paper mills, in the preparation of "BLACK AND WHITE" articles.

Paper men turn to the General Edition of "BLACK AND WHITE" with confidence, knowing that the information contained therein is authoritative and practical.

Hundreds of letters reach the Houghton Editorial Offices expressing appreciation of the feature articles in "BLACK AND WHITE" and telling us how suggestions contained in "BLACK AND WHITE" articles have helped solve difficult problems and saved money in manufacturing operations.

Here are some of the articles that have appeared in recent editions of "BLACK AND WHITE":—

Reducing Power Costs in Industry
Modern Slant On Corrosion
Lubrication vs. Production
Selection Of Anti-Friction Bearings
Ring Oiled Bearings
Wage Incentive, Time Study, etc.

In future issues of "BLACK AND WHITE" will appear, among others, the following:—

Fighting Rust
Plant Housekeeping
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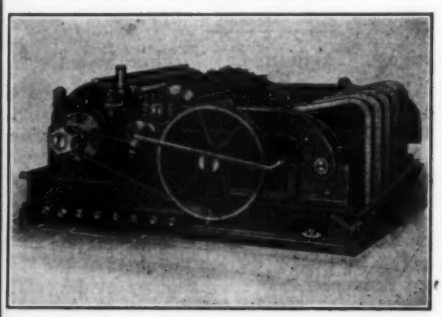
RYTHER SHREDDER

DISCHARGING SHREDDED STOCK DIRECTLY INTO BEATER TUB ELIMINATING CONVEYING SYSTEM.



SAVES FURNISH TIME
SAVES BEATING TIME
SAVES POWER

The shredder installation described reduces the return board broke from two machines and also prepares a liner furnish, consisting of groundwood books and papers. The shredder is mounted on an elevated platform and driven by a thirty horse power motor. This setup is able to make a two thousand pound furnish in twenty minutes. Excessive peak loads on the beater drive are eliminated because the stock is delivered into the beater tub in uniformly fine pieces which readily absorb water and are quickly repulped.

Please ask for Bulletin 627

CANADIAN INGERSOLL-RAND COMPANY, LIMITED
10 PHILLIPS SQUARE, MONTREAL, P. Q.

their flour products. The success experienced by a large cement company which, it is understood, now delivers about 90 per cent of its products throughout the West in paper containers instead of the former jute bags, is a factor which is influencing the milling companies in considering this new departure for their products. Should the milling companies decide on the paper container, as now seems very probable, a new and extensive market will be opened up for Dryden Paper products, which exclusively manufactures these containers in the West.

The Don Valley Paper Co., of Toronto, has appointed John Martin, formerly of Provincial Sales, Ltd., of Winnipeg, as one of its distributors in the Prairie Provinces.

The Abitibi Power and Paper Co., and the Canada Power and Paper Corporation have appointed the following board to direct the destinies of the Thunder Bay Paper Co., their recently acquired subsidiary: Alexander Smith, New York; F. A. Sabbaton, Grand 'Mère; George M. McKee, Montreal; George H. Montgomery, K. C., Montreal; L. R. Wilson, Montreal. The following officers were also elected: Alexander Smith, president; F. A. Sabbaton, vice-president; L. R. Wilson, managing director; W. H. Smith, secretary-treasurer; T. Broadhurst, assistant secretary-treasurer.

Abitibi Jottings

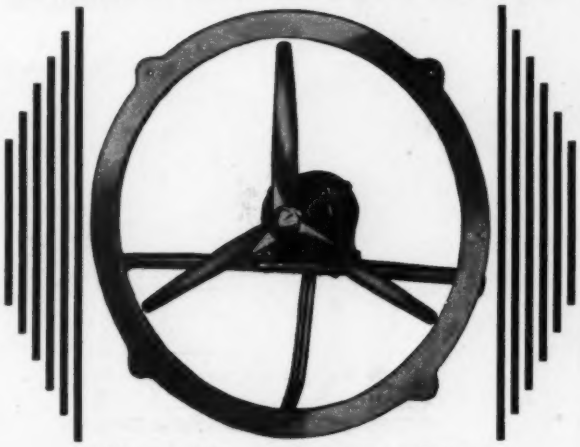
With the issue of January 29, "The Broke Hustler", the house organ of the Abitibi Power and Paper Co. at Iroquois Falls, which had been published weekly for eleven and a half years, ceased as a weekly newspaper, to re-appear in a new garb as the monthly magazine "Abitibi", which is now being published from the head office of the company in Toronto. It is printed on the finest of Canadian-made book paper, with a four-color process ink cover, and contains news from all the mills together with general articles of interest. The change was necessitated by the great expansion of the company, which now owns and operates nine mills scattered from Murray Bay on the Lower St. Lawrence River to Pine Falls, Man., at the center of the Continent. Alex Dewar will continue as editor of the magazine.

A power development scheme on an exceptionally large scale is under consideration for the Abitibi River, north of Cochrane. At present a preliminary survey is being made by a contracting firm but it may be some little time before a definite announcement is made concerning the project. According to reports prevalent at Cochrane, Abitibi Power and Paper is interested in the plan, and it is said that the power which would be developed is intended for consumption in the Sudbury district, which would require the construction of a 200-mile high-tension transmission line. The scene of the proposed development is close to Mileage 70 on the James Bay branch of the Temiskaming and Northern Ontario Railway, near the Abitibi Canyon. If the scheme goes through, it will mean employment for many hundreds of men for a considerable period. An occasional train is being operated from Cochrane to Mileage 70 in connection with the survey, which is chiefly concerned at present with obtaining soundings for the dam which would be built.

On February 27 fire caused damage estimated at $175,000 to the Lybster Division of Alliance Paper Mills, at Merritton. The fire departments of both St. Catharines and Thorold were called to the assistance of the Merritton force. The blaze originated in the broke room, where waste paper and stock were stored. The blaze was brought under control by the united efforts of the three departments after nearly two hours of strenuous work. The portion of the building in which the fire started was a four-story structure. The damage was mostly to stock, building and supplies. The main plant suffered little except from water, and operations are expected to be resumed in about a week's time.

The old Rudd Paper Box Co., which has merged with Firstbrook Bros., has disposed of the old building on Richmond St., W., Toronto, to the Dominion Knitting Mills for $100,000. The lot is 95 by 150 feet with a four-story structure. Possession was taken on March 1st.

Protect the Human Machine



It doesn't take an efficiency engineer to figure out that a man cannot do his best work in a humid, steam-filled, unhealthy and uncomfortable atmosphere.
Ask any medical man what harm steam, acid and fumes do to a man's heart, blood, lungs and his entire respiratory and nerve system.

Better Conditions—Better Work

It may be a platitude (but nevertheless it's a fundamental truth) to say that when you take an interest in the health and welfare of your men they reciprocate, as a matter of gratitude, by taking a greater interest in their work.
Improved working conditions reflect themselves in improved quality of product, increased production and lowered cost—so you may consider it a wise business move on your part after all.

Meier Nu-air
TRADE MARK REGISTERED

fans are made entirely of aluminum—there is nothing to rust or corrode. The propellers are designed according to the latest ideas of aeronautical science and they will move an enormous volume of air with minimum current consumption. The motors are special built, totally enclosed and of ball-bearing construction. No expense has been spared to make these the finest and most efficient fans on the market. They can be used in any opening or duct and will operate in any position. Made in sizes to fit every requirement.
For interior circulation of air we make an all-aluminum portable stand, or wall type, Man Cooler which can also be used for the acceleration of drying processes.

Write us today for literature

Meier Electric & Machine Co.
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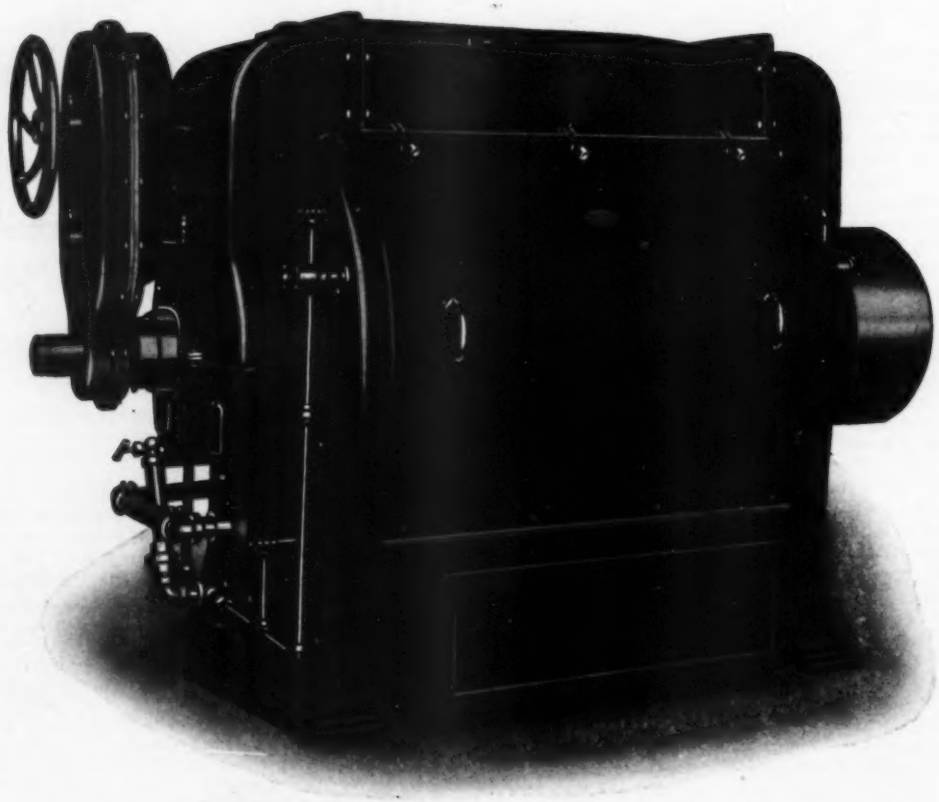
136 S. Meridian St. Indianapolis, Ind.

REED-SPAFFORD PULP SCREEN

(Built in two sizes)



The REED-SPAFFORD PULP SCREEN is remarkably efficient. Its capacity is large and its power consumption is surprisingly low. Let us show you what a saving this screen means to you.

Our Paper and Pulp Machinery is CONSTANTLY IMPROVED

Improved Paper Machinery Co.

Nashua, N. H., U. S. A.

SHERBROOKE MACHINERY CO., Limited

Sherbrooke, Quebec, Canada

❖ NEW BRUNSWICK ❖

Fraser Companies Earnings Higher

The annual report of the Fraser Companies, Ltd., for the year ended December 31, 1928, is of interest not only as indicating increased earnings for the year itself, but as coinciding with the practical completion of an extensive program of development, the results of which will be reflected partly in the earnings for the current year and more so in those of the year 1930. During 1928 this company showed earnings, after deducting operating and maintenance expenses as well as income and other taxes, amounting to $1,765,154 as compared with $1,672,953 for the previous year, and $1,561,825 in 1926. After deductions of bond and other interest, depreciation and depletion, there remained available for the capital stock an amount of $434,632 on 373,665 shares outstanding. One of the features of the balance sheet is the strength of the working capital position in spite of the heavy expenditures on plant, a portion of which came out of the company's own resources apart altogether from the proceeds of the issuing of new securities.

Commenting on the year's operations, President Archibald Fraser stated that during that period the plant extension program at both the Edmundston, N. B., and the Madawaska (Maine) mills had been practically carried to completion Additions to the sulphite mill at Edmundston were completed, the groundwood mill at that plant was brought into operation in October, and the board machine was rebuilt and brought into operation. At Madawaska there are now in operation four high-grade paper machines and it is expected that the board machine at that plant will come into commercial operation early in March. The catalogue paper machine at Madawaska has been in operation for some weeks, and early this month will go into production on the Sears-Roebuck contract. This contract, which covers the supply of the catalogue paper requirements of the big Chicago mail order house for a period of ten years, will gradually absorb the entire tonnage of the existing catalogue paper machine, and will probably require the installation of an additional machine to come into operation in 1930.

The total capacity of the three mills of the company, Edmundston, Madawaska and Chatham, now amounts to approximately 450 tons per day of fine and catalogue papers, paper board and unbleached sulphite.

The current year is expected to witness important developments in the pulp industry along the Miramichi River. International Paper Co. will build a large pulp mill near Chatham. The company recently acquired a large lot of land at Marrison's Cove. In addition to the International mill, which will be started during 1929, Fraser Companies will either double the capacity of their pulp mill at Millbank, near Chatham, or build a new mill between Chatham and Newcastle.

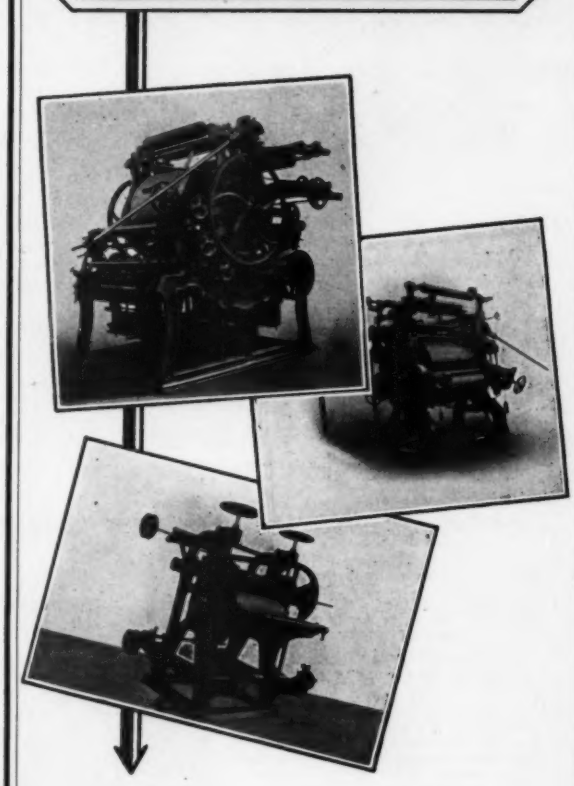
❖ NOVA SCOTIA ❖

It is reported that the Avon River Power Co., which with subsidiary plants supplies power from Windsor, N. S., westward to Huntville and the surrounding territory and eastward to Stewiacke and Shubenacadie, was taken over a few days ago by Montreal capitalists whose names or purchase price have not been announced. A report which could not be confirmed stated that International Power and Paper Co. had taken an option on the common stock of Avon River Power; but the only definite information that could be obtained was that manager R. A. Jodrey had disposed of his interests in the company.

A meeting of the bond holders of the Clyde and Sissiboo Pulp Co. was held on February 15th to give the bond holders' committee full power to sell the undertaking. If no private

PAPER CONVERTING
everything from napkins to wallboard!

WALDRON
Machinery



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Winders and Slitters
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JOHN WALDRON CORPORATION
Main Office and Works—New Brunswick, N. J.
208 W. Washington Street CHICAGO
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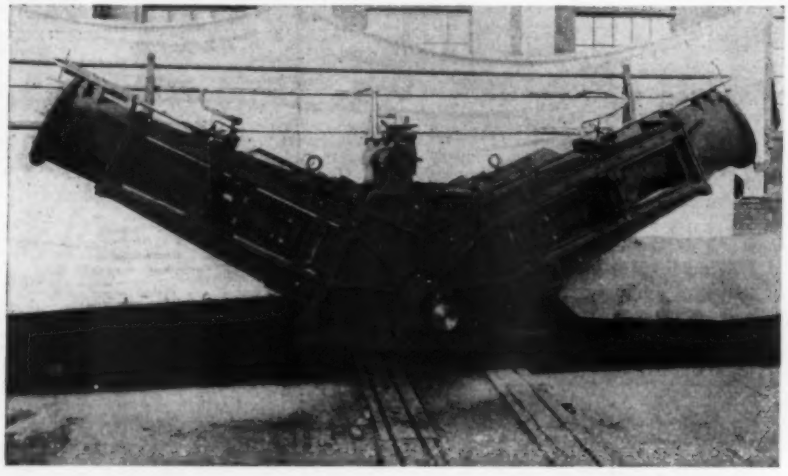
Efficient Machinery for Higher Quality and Lower Costs

The days of plugging along with old, narrow, slow-running paper machines have passed and the paper and pulp makers must now extend this policy of high speed production into all departments of their mills.



"Speed Up Production, Improve Quality, Cut Down Costs," is the slogan that is ringing through all industries as a result of competitive conditions the like of which never before existed in this country.

We have machines which will help you to completely exemplify the aforementioned slogan and we solicit your business, knowing from experience what these machines will do.

Above:

KAMYR CONTINUOUS GRINDER

(PATENT)

Low first and maintenance cost. Very large production. Continuous Hydraulic Grinder with highest efficiency. No extra heavy foundation required.

Right:

KAMYR WET MACHINE

(PATENT)

Up to 100 air dry tons Sulphite or Sulphate or 50 tons groundwood per day produced, 50-60% air dry. Enormous savings in labour, wires, felts, upkeep, floor space, steam, power, etc.

WE ALSO HANDLE:

K. M. B. SLAB CHIPPER

Makes saw mill and box factory waste into good quality chips for pulp at low cost.

K. M. W. ROUND WOOD CHIPPER

Characterized by making chips of very even quality with very small loss of sawdust and inferior chips. Low speed, low power consumption, high production.

G. D. JENSSEN CO.

200 Fifth Avenue **New York, N. Y.**

Sole Agents in U. S. A.

For Paper Machinery Ltd., Montreal

sale is made before April 15 of this year, it is proposed to sell the concern by public auction, without any reserve. The plant consists of a groundwood mill on the Clyde River, with a daily capacity of 27,000 pounds (dry) per 24 hours.

Mersey Mill to Install Three Machines

Construction of the main unit of the Mersey Paper Co.'s mill, housing the machine room, stores and offices, is already well advanced. Considerable progress has been made on the groundwood and sulphite mills, and the mixing room. The dock system is almost half completed, and all foundations and piers are in place.

The first paper machine will be installed and in operation in October, 1929. The second machine will be in operation in November, and, according to present plans, the third production unit will be added to the mill in 1930. The mill itself is being built with the idea of this expansion, a temporary wall being placed on one side of the building, in order to facilitate the installation of the third machine.

❖ BRITISH COLUMBIA ❖

Construction Proceedings at Port Mellon

Marking another step towards the construction of a pulp and paper mill at Port Mellon, on Howe Sound, the Vancouver Kraft Co. has awarded a contract to the Vancouver Pile Driving and Contracting Co. for the construction of the second unit of the project, which comprises a sawmill building to cost about $25,000.

W. B. DuBois, vice-president of the Columbia Paper Co., the parent company of Vancouver Kraft, who spent a few days in Vancouver following the award of the contract, announced that it was hoped to commence pulp manufacture at Port Mellon some time in July, using some of the reconditioned pulp from the plant originally established there by the Whalen interests and afterwards acquired by Vancouver Kraft, of which he is secretary.

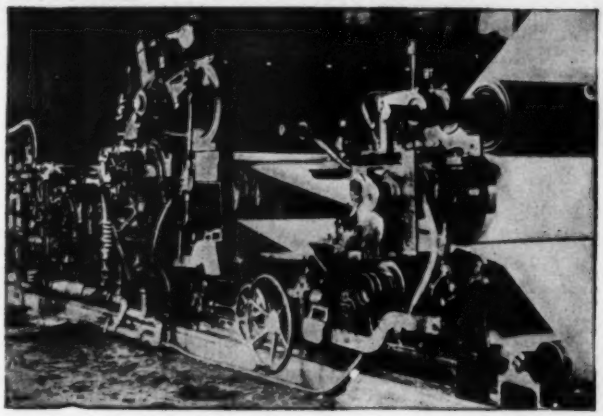
Owing to the exceptionally cold weather which has been prevailing, the level of the lake above Ocean Falls fell considerably below normal and resulted in a shortage of water which forced the newsprint mill of Pacific Mills, Ltd., to close down for about a month. Advantage was taken of this shut-down to overhaul the machinery thoroughly, so that none of the employees were laid off during that time.

Erection of a large paper mill at Prince George may still be regarded as one of the certainties, in the opinion of Hon. F. P. Burden, Minister of Lands and Forests for British Columbia, who was a recent visitor to that district. Conditions have conspired to hamper the development of the mill which was projected some time ago, but due to the fact, not generally known, that those interested in the Prince George paper mill have already tied up approximately $1,000,000 in their venture, it is believed that there is less possibility of their making other arrangements than might be considered due to the present condition of the industry in Canada.

Mulch paper, one of the most revolutionary innovations in the history of agriculture, has now been placed on sale for the first time in Western Canada by the Sidney Roofing and Paper Co., of Victoria.

The plant of the Canadian Scottish Paper Co., at New Westminster, has been taken over by a syndicate of New Westminster and Vancouver business men. The premises will be utilized for the creosoting of shingles.

The Anglo-Newfoundland Development Co., operating the pulp and paper mills at Grand Falls, Newfoundland, established by the late Lord Northcliffe some years before his death, exported paper to the value of $6,232,200 during 1928. The Rothermere interests control this pulp and paper company, with the bulk of the shipments of paper made to the English newspaper chain operated by the same interests.



Thoroughly cleaned felts need washing less often

WASHING felts the Oakite way removes all dirt, and other foreign matter. Felts are left thoroughly clean, soft and absorbent. And, more than that, safe Oakite cleaning makes them last longer.

Oakite speeds cleaning, too. Rinsing is faster and valuable minutes are saved on every felt washed. Machines are shut down less often and for shorter periods of time.

Call in our nearby Service Man and ask him to prove that Oakite will save you money and prolong the life of your felts. No obligation. A card or phone call will bring him.

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Albany, N. Y., Allentown, Pa., Altoona, Pa., *Atlanta, Baltimore, *Boston, Bridgeport, *Brooklyn, N. Y., Buffalo, *Camden, N. J., Canton, O., Charlotte, N. C., Chattanooga, Tenn., *Chicago, *Cincinnati, *Cleveland, *Columbus, O., *Dallas, *Davenport, *Dayton, O., Decatur, Ill., *Denver, Des Moines, *Detroit, Erie, Pa., Fall River, Mass., Flint, Mich., Fresno, Cal., *Grand Rapids, Mich., Harrisburg, Pa., Hartford, *Houston, Tex., *Indianapolis, *Jacksonville, Fla., *Kansas City, Mo., *Los Angeles, Louisville, Ky., Madison, Wis., Memphis, Tenn., *Milwaukee, *Minneapolis, *Moline, Ill., *Montreal, Newark, N. J., Newburgh, N. Y., New Haven, *New York, *Oakland, Cal. *Omaha, Neb., Oshkosh, Wis., *Philadelphia, Phoenix, Ariz., *Pittsburgh, Pleasantville, N. Y., Portland, Me., *Portland, Ore., Poughkeepsie, N. Y., Providence, Richmond, Va., Reading, Pa., *Rochester, N. Y., Rockford, Ill., *Rock Island, Sacramento, Cal., *San Francisco, *Seattle, *St. Louis, *St. Paul, South Bend, Ind., Springfield, Mass., Syracuse, N. Y., *Toledo, *Toronto, Trenton, *Tulsa, Okla., Utica, N. Y., *Vancouver, B. C., Waterbury, Conn., Wichita, Kan., Williamsport, Pa., Worcester, Mass.

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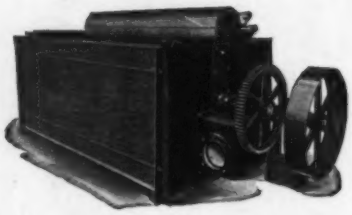
Industrial Cleaning Materials and Methods



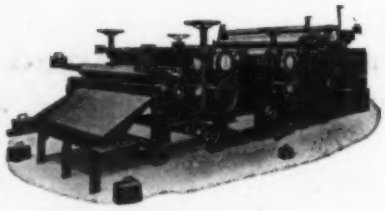
DECKERS

PULP OLD PAPERS

We offer a wide choice in vat design to suit every requirement. This machine in your pulp mill, as a multi-cylinder washer for old magazine or bleached stock, or the special design for handling mixed papers for Boxboard will meet your most exacting specifications.

Our long experience enables us to market these high grade machines at a very reasonable price.

Sizes: 30" x 48" up to 48" x 120"

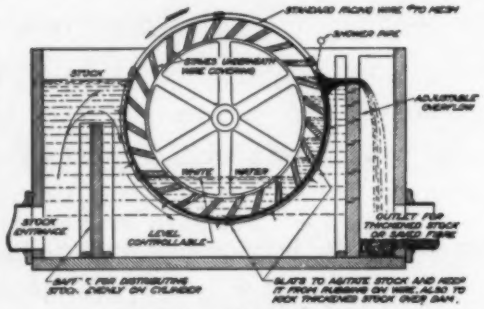


Rogers and Special Wet Machines

The standard machine for producing high density sheet pulp for direct use or for Dryer. A low cost, simple, well proven means for reducing your labor, power and upkeep.

When dry stock is not desired the Single Press will handle the same high capacity with the same labor at still lower cost.

Built in units of 50 tons capacity or less



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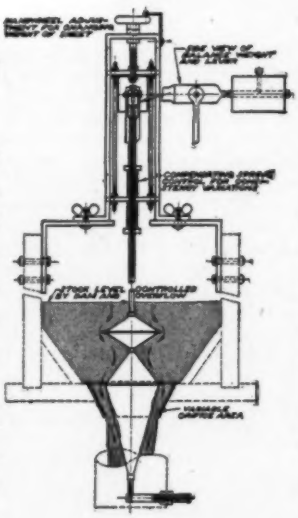
Saveall, Washer, Water Filter

The design of this popular machine is such that the cost per unit of material handled is amazingly low.

The wire does not have to drive and carry a couch roll, nor even help to discharge the thickened stock. Long life results and, with the sturdiness of the remaining parts, makes it almost automatic in operation, so seldom is any attention necessary.

Boivin Weight Regulator

Over 50% of the Boivins now operating were repeat orders.



Capable of handling any clean pulp stock in capacities above 12 tons daily, a trial of this device on our "money-back" guarantee of satisfaction will convince you that the Boivin lowers production cost and makes your customers happy. What more can you ask?

GLENS FALLS MACHINE WORKS

GLENS FALLS, NEW YORK

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E. K. Mansfield Co., 501 Fifth Ave., N.Y.C.
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See pages 336 and 337 in the 1928 Paper and Pulp Mill Catalogue

ENGLAND

Paper Trade Conditions

Shortage of Esparto—An unusual situation obtains in the esparto section at the present time. Difficulty is being experienced in obtaining supplies at reasonable prices. There is a shortage of grass imports, and quotations rule at about $35 a ton for Spanish and $22.50 a ton for African. Some mills are meeting the situation by an increased use of wood pulp, although in this section firm prices are not the order of the day, particularly for spot buying. Imports of esparto grass in 1928 fell to 277,943 tons from 289,587 tons in 1927. This decline in grass shipments is a serious matter, particularly in view of the fact that plants have been modernized and equipment started up for large-scale production of esparto papers.

Official reports state that there is far more grass available than ever gets on the market, but this position does not alter the likelihood of high prices becoming stabilized. The esparto mills at present find it difficult to keep their home markets free from encroachment by the woodfree makers, and they are also menaced by continental competition, where the lower prices ruling for writings have to be taken into serious consideration.

In spite of the fact that the cost of esparto grass has gone up to about $5 a ton, and that there is a probable shortage of supply, the makers have recently been competing for big orders at prices but a fraction above the free wood prices. Continental competition is being felt in printings as well as writings, and the continental makers of white printings by undercutting have deprived British mills of much tonnage, and magazines that normally used nothing but esparto papers are contenting themselves with the second best quality. Until recently British mills took nearly the whole crop of the annual crop of North African esparto, but there has recently been a growing demand from certain continental mills for this grass, which has had the effect of causing some uneasiness in regard to future supplies. But there may also be another serious factor affecting the supply question. Efforts are being made to open up large tracts of country along the northern coast of Africa for fruit growing and agricultural developments, by irrigating the land with water from surrounding hills. These developments have so far been successful, and the natives formerly engaged in pulling and transplanting esparto grass—hard work for which they received a scanty livelihood—are finding a more pleasant and remunerative occupation in the orange groves and vineyards. It is almost certain that workers will only be lured back to collect the esparto grass harvest by a payment of higher wages, which will mean an increase in the grass f. o. b. British ports, and a permanent increase in the costs of esparto papers.

Fine Papers—The slight improvement previously noted in this section has been maintained, and the larger manufacturers are moderately busy. Export trade is improving steadily and some of the leading firms are adding to their representations abroad. The Australian market is said to offer the best scope.

A representative number of paper manufacturers are arranging for exhibits at the Printing and Allied Trades Exhibition to be held at Olympia in London on April 11 to 25. Among these are makers of high class writing papers, gummed papers and enamels, boards and cover papers, blotting, bank papers, imitation arts, and fine printings and writings. The general feeling, however, is that the paper trade is inadequately represented, and it is pointed out that an exhibition which is held only once in four years, and which is officially recognized by the printing trade, should be better supported by supply houses which provide the raw material.

Wrapping Papers—This is the most isolated section in the whole industry, and the application of safeguarding to this type of paper has tended to widen the line of demarcation between this and the other groups, between which there

RYERSON

Immediate Shipment from Stock

Bars, Shapes, Structurals, Rails, Plates, Sheets, Rivets, Bolts, Nails, Wire, Chain, Turnbuckles, Shafting, Boiler Tubes, Boiler Fittings, Corrugated Sheets, Concrete Reinforcing, Welding Rods, Babbitt Metal, Tool Steel, Bar Iron, Refined Iron, Floor Plates, Safety Treads, Small Tools, Machine Tools, etc.

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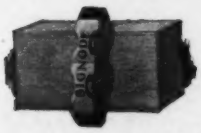
Saved $1.50 per Crate!



The Carr Fastener Co. are saving $1.50 a crate through the use of Signode Tensional Steel Strapping. Crating time is cut, lumber is less and freight bill reduced. We will be pleased to send you full details if you are interested.

And this is but one of thousands of manufacturers who are saving money and securing safer shipments of every type. Signode is applicable to boxes, crates, bundles, cartons, etc. Why delay longer? There is no obligation, ask us to check up in your own shipping or write for catalog No. 15.

Signode Steel Strapping Co.

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SIGNODE

The Sealed Steel Strapping

We also manufacture round wire tensional reinforcements, all forms of nailed strapping, pail clasps, clutch nails, tag fasteners, etc. Write for general catalog.

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CONSULTING ENGINEERS

Plant Analysis, Design and Construction Supervision. Mechanical Equipment Layout

Steam, Hydraulic, and Electric Power Houses

GRAND CENTRAL TERMINAL BLDG.
NEW YORK

is generally a certain amount of overlapping. The introduction of kraft paper was also an influential factor in segregating this section of the industry. Kraft paper was first introduced into this country from Scandinavia, but British manufacturers after many years experimenting with imported pulps, are now able to produce krafts equal to the best imported varieties. Certain prejudice still exists, however, against British kraft, and it will probably be several years before the strong position of the foreign makers in this country is in any way weakened.

Newsprint—The situation is reported to have improved in the newsprint section. Most of the mills are turning out maximum quantities, and are likely to be doing so for some months. It is thought possible that the General Parliamentary Election to be held in June may possibly have an adverse effect upon business; but, on the other hand, there is a possibility of it acting as a stimulus.

The Harrison Combine

The sixth annual general meeting of the Inveresk Paper Co., Ltd., was held recently at Edinburgh, Mr. William Harrison LL.B., chairman of the company presiding. He pointed out in the course of his address to shareholders that although the position in the paper trade during 1928 was by no means satisfactory, the results of their own company's developments which he was reviewing were gratifying to the directors and, he hoped, to shareholders. Still further grouping ramifications were revealed when Mr. Harrison drew attention to a new company which was in process of formation, for the purpose of amalgamating and carrying on the business of thirteen more important provincial newspapers, which, he pointed out, was one of the most powerful groups of provincial newspapers in Great Britain, and, he thought, one of the most prosperous. "I have no hesitation in saying, "Mr. Harrison concluded, "that we have equipped our mills during the last two years with new plants which are fully equal to anything in the papermaking industry, not only in this country, but in the world. I am satisfied that with these new plants in full operation we shall be in a position to meet competition from whatever source it may arise."

Import and Export Figures

Increases were shown in both the imports and the exports of paper during January, as compared with the corresponding month in 1928, and the following figures show the values of both imports and exports, together with the increases or decreases as compared with January, 1927 and 1928.

IMPORTS

	Jan., 1929.	Inc. (+) or Dec. (—) as compared with 1928.	Inc. (+) or Dec. (—) as compared with 1927.
Paper-making Materials...	1,277,059	+374,980	— 31,572
Paper and Cardboard.....	1,446,679	+138,618	+118,506

Quantities of the same articles imported:

	Jan., 1927.	Jan., 1928.	Jan., 1929.
Wood pulp, tons	134,713	88,869	158,232
Paper, cwt.	1,365,021	1,312,420	1,491,383

EXPORTS

	Jan., 1929.	Inc. (+) or Dec. (—) as compared with 1928.	Inc. (+) or Dec. (—) as compared with 1927.
Paper-making Materials..	118,177	—6,682	+29,854
Paper and Cardboard.....	804,156	+32,338	+21,977

Quantities of the same articles imported:

	Jan., 1927.	Jan., 1928.	Jan., 1929
Paper-making mater'ls,tons	9,939	16,327	16,311
Paper & cardboard, cwt....	77,323	374,516	401,851

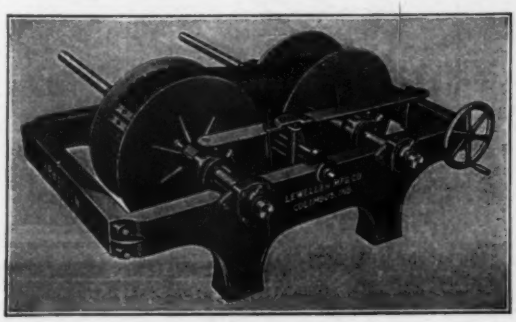
The Australian Market

A recent report from Australia states that Australian paper consumers are fashioning their trade on the American model, further pointing out that if the market is to be held and increased by British houses, a little more thought will have to be given to publicity methods. A week later report states that a strong and growing demand exists for absorb-

WOULD YOU LIKE AN AUTOMOBILE

capable of being operated at only one speed?

Of course not. Yet it is just as ridiculous to try to operate cutters, winders, slitters, dryers, or even the paper mill itself, at a fixed speed. Fitting the speed to the conditions of your material means better quality and greater quantity of finished product.



The LEWELLEN Variable Speed Transmission enables you to control the speed of any unit at any time. No guess work about it. You simply turn a wheel or press a button. Whatever your variable speed problem may be, there is a LEWELLEN Transmission to solve it for you. Write us and let us prove this to you, without cost or obligation.

Lewellen Manufacturing Co.
COLUMBUS INDIANA

LEWELLEN Variable Speed TRANSMISSION

An Announcement

KARL A. LEFREN, Consulting Engineer, takes pleasure in announcing the incorporation of his business, under the firm name of

KARL A. LEFREN, INC.

Consulting Engineers
171 Madison Avenue
New York, N. Y.

Whose Officers are:

KARL A. LEFREN, *President*
JOHN E. GIFFELS, *Vice President*
WILFRED WYBURN, *Treasurer*
FRANCIS H. LEWIS, *Secretary*

Mr. Lefren wishes to extend his hearty thanks to his Clients and all others who have helped to make this business a successful one, and expresses the hope that they will extend to the new Corporation their continued confidence and cooperation.

INDUSTRIAL POWER
PAPER AND BOARD MILLS
MILL CONSTRUCTIONS

REPORTS
DESIGNS
CONSTRUCTION

ent paper for copying machines, duplicating, cover, cartridge, blotting, filter, and gummed papers, and for stencil carbon and similarly prepared copying papers. British firms, it says, have the greater part of this trade, but competition from the United States is increasing in stencil carbon and similar papers. Tissue and tissue cap paper is mainly obtained from Sweden, but there again the American share is growing. Writing and typewriting paper is largely from the United Kingdom; competition is chiefly from Norway, but Sweden, Finland, Germany, Canada, and the United States of America have a share in the trade.

On the wrapping side, Britain's share of imports is very small, being $1,865,030 in 1927-28. Sweden occupies the leading position in this section, while a fair proportion of the demand for kraft is satisfied by Canadian, Norwegian, and U. S. firms. British manufacturers are told that millboards, strawboards, cardboard, and other boards have an expanding market, while an excellent demand exists for manufactured stationery, particularly for better quality lines, while the sale of paperhangings, wall-papers, and the like is steadily increasing.

❖ NEW ENGLAND ❖

Eastern Mfg. Co. Shows Profitable Year

One of the finest operating statements that the Eastern Manufacturing Co., Bangor, Me., has presented to the public in years, was recently given out through the Bangor offices of the company.

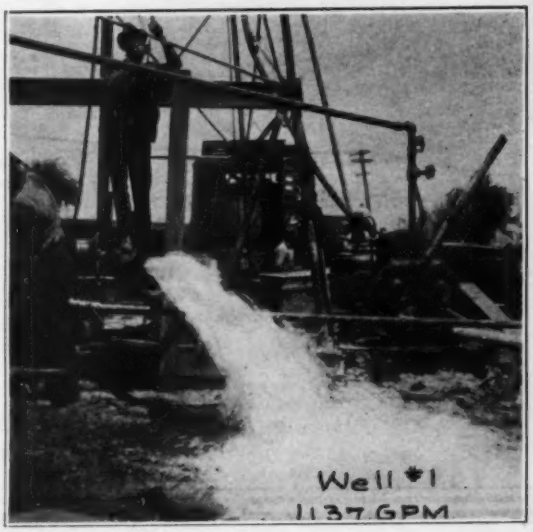
It is about a year since reorganization of the company's management, giving control to State of Maine individuals. The gross sales for the year totaled $6,651,623, the net sales $6,192,902. The gross operating income was $1,236,445, the net income $598,666. Several items were fully charged off including Passamaquoddy stumpage at $186,000, unusual expenses $92,743, and the sale of an open account for $87,892 for the Atlantic Precision Co., or a total charge off of $366,703. After deducting bond interest, there was a net income applicable to surplus of $420,471, and a current surplus of $1,849,000. Anticipating this very favorable change in the income status of the company, there was a brisk demand for the company's preferred shares on the Boston stock exchange. Edward K. Graham, of Bangor, was re-elected president at the annual meeting. Stuart B. Copeland was re-elected vice president and general manager.

Paper Division Hears Talk on Testing

Roger C. Griffin, assistant treasurer and director of tests for Arthur T. Little, Inc., experimenting and industrial chemists of Cambridge, Mass., addressed the Paper Division of New England Purchasing Agents Association at the Boston Architectural Club, November 11 at a luncheon meeting. His discussion dealt with "The Testing of Paper." Mr. Griffin delved into fields not ordinarily considered by paper testers. He described methods used to determine the freedom from metal particles of radio paper, the "fadeometer" an apparatus which gives artificial sunlight that is available 24 hours in a day, tests for bleaching and overbleaching, stiffness tests for cards, and the absorptive property tests for roofing papers. The glarimeter to determine the light refracting qualities of coated and other papers, as well as the tests for checking on the amount of coating used in paper. The attendance was large, including purchasing agents for leading printing and industrial companies of New England and the many questions attested to the interest manifested.

The Brown Company, of Berlin, N. H., has announced a new name for its recently introduced special book pulp in bleached sulphite. This pulp will be known as Bright White. The change in name was decided upon because of the great variety of book pulps on the market. For the new pulp is claimed a wonderful color, a high degree of cleanliness such as characterizes the Burgess standard sulphite, and a strong long fiber. The company is not letting the development of

What More Do You Want?



Lower Cost—
Better Paper—
More Profits—

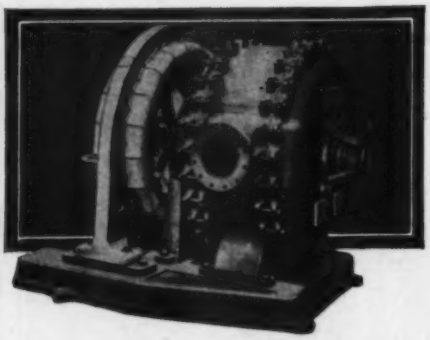
Water plays an important part in the manufacture of paper and must be of the right quality—economical and dependable.

The Layne Water Well System has proven a sound investment in numerous paper mills.

Let us tell you what it will do for you

Layne & Bowler, Inc.
Memphis Tenn.

In these mills—and in 600 others



Nash Hytor Vacuum Pump. For flat boxes, wires, felts, and suction rolls. Capacities up to and exceeding 5,000 cu. ft. of air per min.

Nash Hytor Vacuum Pumps and Jennings Flat Box Pumps are preferred by leading manufacturers of pulp and paper in this country and Canada. This preference is again affirmed by the following partial list of recent installations.

Abitibi Power & Paper Co., Iroquois Falls, Ont.
7 Hytor Vacuum Pumps

Advance Bag & Paper Co., Advance, La.
5 Hytor Vacuum Pumps

Anglo-Canadian Pulp & Paper Co., Limoilou, Que.
8 Hytor Vacuum Pumps—4 Jennings Flat Box Pumps

Fort William Paper Co., Fort William, Ont.
1 Hytor Vacuum Pump

Fraser Papers, Ltd., Madawaska, Me.
6 Hytor Vacuum Pumps

Mead Fibre Co., Kingsport, Tenn.
2 Hytor Vacuum Pumps

Spanish River Pulp & Paper Co. Sturgeon Falls, Ont.
2 Hytor Vacuum Pumps

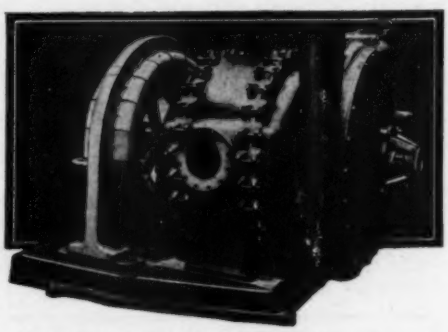
Spruce Falls Power & Paper Co., Kapuskasing, Ont.
4 Jennings Flat Box Pumps

Taggart Oswego Co., Oswego, N. Y.
3 Hytor Vacuum Pumps. 1 Jennings Flat Box Pump

Thunder Bay Paper Co., Port Arthur, Ont.
10 Hytor Vacuum Pumps

Washington Pulp & Paper Co., Port Angeles, Wash.
2 Hytor Vacuum Pumps

Mills in which Nash equipment is installed number over 600 and make more than 81% of the total production of paper in the United States and Canada. Write for complete details.



JENNINGS FLAT BOX PUMP. Capacities from 150 to 5000 g.p.m. of water together with 80 to 2300 cubic ft. of air per min.

Jennings Pumps

THE NASH ENGINEERING CO. 161 WILSON ROAD SOUTH NORWALK, CONN.

The Eternal Pursuit *of* Paper Perfection

THE recent convention indicated again that as long as paper men continue to foregather, improvements may be confidently expected. The Seaman organization is in itself a continuous convention of different makes of papers. Here these papers are grouped together for economical and useful distribution — continuously realizing in a similar manner the benefits of such an association and widespread contact.

SEAMAN PAPER COMPANY

CHICAGO	411 West Ontario Street
NEW YORK	200 Fifth Avenue
ST. PAUL	1507 Pioneer Bldg.
MINNEAPOLIS	515 Washington Avenue
MILWAUKEE	1st Wisconsin Nat. Bank Bldg.
BUFFALO	93 Mississippi St.
DES MOINES	425 W. Grand Ave.
PHILADELPHIA	815 Atlantic Building
ST. LOUIS	1006 Clark Avenue

SEAMAN PAPERS

this pulp, however, affect the manufacture of its regular Nos. 1 and 2 book pulps.

Paper Traffic Heavier

Pat J. Dowd, of the Holyoke Traffic Bureau and chairman of the Paper and Pulp Committee of the New England Shippers Advisory Board, and C. L. Whittemore, vice chairman, report that paper and paper articles will move in larger volume during March than for the same month last year.

The general indicated condition for the first three to four months of the year according to a recent survey of the committee is that flat writing paper, newsprint, and printing paper shipments will equal in volume those for the same period in 1928. Tissue paper, paper napkins and some other tissue specialties will show a slight increase in shipment. Papeteries, envelopes, pads, tablets, and blank books also indicate about the same movement for the first quarter as for the same period last year. Equally good operating and shipping conditions are reported by the box board, pulp board, and straw board divisions of the industry, though conditions in the latter are expected to show a sharp decline very shortly. The railroad service rendered by the New England carriers is pronounced excellent.

New Sales Manager for Wheelwright Co.

Carl Lincoln, formerly with Bradner Smith and Co., of Chicago, has become resident sales manager of the George W. Wheelwright Paper Co., Leominster, Mass., following confirmation of a contract made with directors of the company on February 15.

The Wheelwright Paper Co., has been operating under difficulties for some years since the general supervision of its affairs was entrusted to a group of creditors, all of whom agreed to extend their claims, having confidence in the integrity of the owners and the quality of the paper made. The company has slowly worked itself into a better financial position, and is taking an aggressive attitude, having recently developed several new lines of great promise including its Corinthian cover and the colors in Best Plate Finish.

Dispute Coating Mill Valuation

The S. D. Warren Co., is aiding the city of Westbrook, Me., where its paper mills are located in its effort to have reduced the $500,000 increase in valuation assessed against that place because of the new Warren coating mills which were recently completed. A year ago when construction on the new finishing and coating plant was under way, an increase of $150,000 was made, and now $500,000 has been added making a total of $650,000.

Officials of the S. D. Warren Co., claim their tax is already excessive as compared to that of other Maine mills. The Warren Co., is undoubtedly right in insisting that the increase is excessive, but there is no question that its new coating property is one of the most complete in the country and will afford an opportunity to expand its production as demands warrant.

The new Aero pulverized coal plant of the Crocker Burbank Co. Ass'n, of Fitchburg, Mass., has been installed and is ready for production. This plant will develop power at a central station for all the mills with machines now equipped for electric drive. Process steam for drying paper and other purposes will be piped from the central station. A contract has been closed with the Pocahontas Fuel Co., for the type of coal most suitable for this plant. Operating results may be announced at an early date.

The S. D. Warren Co., has announced an issue of 30,000 shares of common stock of $100 par which will include 5000 shares carrying a guaranteed dividend of $7 for five years from January 1, 1929, is to be offered to employees. The plan was announced the first week of the month by Roger D. Smith, president of the company. The company believes that the employees should participate to a greater

Orr Felts

We venture that you pay mighty close attention to the B. T. U. in the coal you buy, the grade of oil you use for lubrication, or the rate you pay for power—and why shouldn't you?

Do you also try just as hard to get the exact kind of felts your job should have—the one make that will do the best extracting job and wear the longest?

We, at ORRS, know, and can bring the evidence to support us, that ORR FELTS will take out water faster and last longer than other felts—thereby prove their greater desirability.

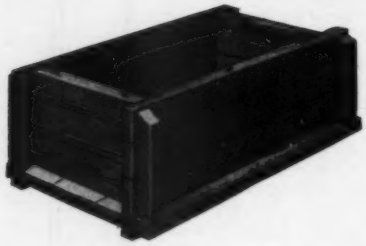
Try Orrs. You'll find that we're right.

Full line of textures and sizes. A felt for every mill requirement.

The Orr Felt and Blanket Co.
Piqua Ohio

STEARNS TANKS

BOX TANKS
ROUND TANKS
HALF ROUND
TANKS



ACID TOWERS
STUFF CHESTS
STAVE PIPE

If it is a wood tank of any shape or design we can make it for you. Our engineering department is ready to assist and advise you.

The A. T. Stearns Lumber Co.
Neponset, Boston, Mass.

EVERYTHING IN WOOD OR WOODWORK 1849

STEARNS TANKS

GEORGE F. HARDY

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extent in the ownership of the company and the guarantee is provided as an incentive. The company will permit the exchange of bonds for these shares which will thereby net the owner a higher return.

In the report of the Eastern Claim Conference, which is contained in that rendered by the New England Shippers Advisory Board, mention is made of containers that meet A. R. A. specifications. It is noted in this connection that the fiber shipping cases of leading paper board and box manufacturing companies pass these tests with considerable margin to spare.

Production of glassine paper by the Deerfield Glassine Co., of Monroe Bridge, Mass., has been increased 25 per cent by the new equipment installed during the past three months. Two machines are in operation; new beaters have been installed and old beaters rebuilt; a miniature beating equipment has been installed in the laboratory, and the pulp handling equipment increased by a Lidgerwood cableway handling a ton of wood at a time; Robbins pulp conveyors handle the shredded wood through all processes from storehouse or from shredders to the beaters. "Plateglassine" is the name of their new product and they have adopted as a slogan "As Plate Glass is to Other Glass, so Plateglassine is to Other Glassine".

The New Haven Pulp & Board Co., New Haven, Conn., anticipates having the new Westinghouse stokers, two of which have recently been installed in its boiler plant, in operation by the first week of March. The stokers are of the latest Westinghouse design and embody all modern features.

The Paper Division of the New England Purchasing Agents Association has followed the policy of allowing one of its members a month's chairmanship, to obtain during that brief period the maximum resources of such member in the shape of new ideas and original speakers.

Bird and Son, Inc., have just contracted with The Mid-West Machine Company, Dayton, Ohio, for a continuous beating system for their Phillipsdale, R. I. mill. An item in this column of the November, 1928 issue of THE PAPER INDUSTRY stated that these beaters would be supplied by another company.

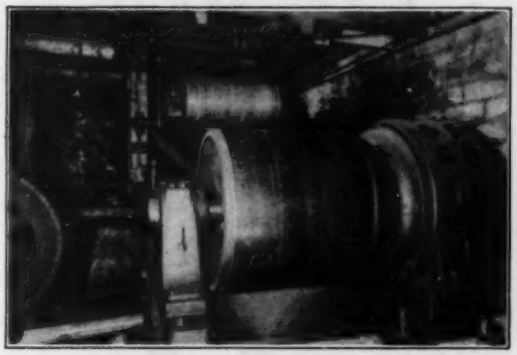
The Brown Company of Portland, Me., and Berlin, N. H., has outgrown its present regional sales offices at Boston, and office space double the size of that occupied at present on the 11th floor of the Chamber of Commerce building, 80 Federal street, will be taken about the first of March. Dr. Richard L. Rice is in charge of this office. There are eight salesmen under his general supervision including W. L. Gilman, pulp sales; Karl H. Ways, paper sales; E. C. DuPont, chemicals; C. F. Werner, tubular fiber products; Eugene Hanson, E. M. Sanders, F. G. Whitcomber, towel sales; Arthur Sewall and George Ashworth, "Onco" sales.

George H. Plummer, 77 years of age and one of the founders of the famous paper box company of Lynn, formerly Littlefield & Plummer, more recently Littlefield & Moulton, died on February 12 at the Massachusetts General Hospital, Boston.

The Southeastern Division of the American Pulp and Paper Mill Superintendents Association will be held at the Virginian Hotel, Lynchburg, Va., Saturday, March 23, 1929.

The Penna.-New Jersey Division of the American Pulp & Paper Mill Superintendents will hold a meeting at the Hotel Dupont in Wilmington, Dela., April 6, 1929. An interesting program has been arranged—mills and manufacturing plants will be visited in the morning, papers and discussions in the afternoon. There will also be a luncheon and banquet at the Hotel Dupont.

RHOADS TANNATE WATERSHED LEATHER BELTING



LITTLE STRETCH OR SLIP

BUT little of this 78-foot, 40-inch wide belt shows in our picture. It runs a line of beaters, Jordans, agitators and a stock pump on the floor above. It has been running nearly six years, and is in excellent condition.

It is one of a number of Rhoads Tannate Watershed Belts giving an exceptionally high degree of satisfaction in this mill. A report says "Although frequently overloaded, they show very little stretch and no slippage."

Rhoads Tannate Watershed Belts are always sold under the Rhoads Service Guarantee which leaves you to be the judge of whether your purchase is satisfactory.

May we have your order on this basis?

J. E. RHOADS & SONS

Philadelphia - 37 N. Sixth St.

New York—104 Beekman St. Atlanta—70 Forsyth St., S. W.
Chicago—24 N. Clinton St. Cleveland—1224 W. Ninth St.
Factory and Tannery, Wilmington, Del.

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148 STATE ST.
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COMMERCIAL ALUM
CMC
IRON FREE ALUM

"For Better Service" use the HOLYOKE wire
Decreases Cost - Increases Production
HOLYOKE WIRE CLOTH CO.
Manufacturers of
Fine Fourdrinier Wires, Cylinder Covers and Dandy Rolls
Water Marks A Specialty
HOLYOKE MASSACHUSETTS

PAPER MACHINE

ROLLS ROLLS

We Make
All Kinds for
Any Machine

UNION MACHINE CO.

FITCHBURG, MASS.

❖ NEW YORK CITY ❖

Flintkote Absorbs Pioneer Mill

According to information obtained from officials of the company in New York City, the Flintkote Company, Inc., large manufacturer of roofing and flooring felt with plants in Little Ferry, N. J.; New Orleans, La., and Lockport, N. Y., has acquired the Pioneer Paper Company in Los Angeles, Cal., reputed to be the largest producer of felt on the Pacific Coast. It is not believed that news of the purchase of the Pioneer mill by the Flintkote Company has been made public as yet, but it is stated that the transfer has been made.

It is understood that the Flintkote Company will operate the Pioneer mill as a separate unit, under its own organization and having its own personnel of executives. It was only a comparatively short time ago that the Flintkote Company bought the felt mill of the Beckman-Dawson Roofing Company in Lockport, N. Y., which plant is now being operated as a separate unit by the Flintkote Company.

Announcement is made in New York that the Saranac Pulp & Paper Company, Inc., of Plattsburg, N. Y., has acquired the Independent Paper Mills, Inc., of Plattsburg, for which latter company equity receivers were appointed in January. The manufacture and distribution of the complete line of Hy-G paper napkins, towels and dispensers of the Independent Mills will be continued as formerly without interruption, and the sales office of the company will be at the office of the Saranac Pulp & Paper Company, Inc., at 475 Fifth avenue, New York.

At the recent annual meeting of the J. E. Linde Paper Company, among the oldest and foremost paper jobbing concerns in New York City, the following changes in officers were effected: Alfred Kinn, formerly vice president, becomes treasurer and in addition will fill the newly created position of chairman of the board; Bertram E. Linde, formerly treasurer, becomes president, succeeding Mrs. Kate S. Linde, who now becomes vice president. Mr. Linde is the son of the late J. E. Linde, who established the business more than half a century ago. The other officers remain the same: William Steadman, second vice president; A. C. Wetmeyer, secretary; E. P. Taddiken, assistant secretary, and John Finnegan, assistant treasurer.

Transparent wrapping paper, or cellophane, used for bread and other foodstuffs and in many commercial lines, must pay a duty more than double the sum formerly exacted, according to a decision of the United States Customs Court made public here a few days ago. The decision, made in favor of the Du Pont Cellophane Company, changes the tax status of the paper from Paragraph 42 of the Tariff Act, where it was subject to a duty of 25 per cent ad valorem as similar to manufactures of gelatin, to Paragraph 31, where it is dutiable at 60 per cent as a compound of cellulose in sheets. The action, as a test case, was brought by the Du Pont Company, and was vigorously contested by importers. Attorneys for the defendant companies announced that they would appeal the decision to the Court of Custom Appeals at Washington.

A petition in bankruptcy was filed on February 20 by the Berkshire Paper Board Mills, Inc., of Mellenville, N. Y., showing liabilities of $166,841 and assets of $96,125 in addition to insurance policies. Of the liabilities, $50,000 is secured. Afterward, Judge Mack appointed the Irving Trust Company, New York City, receiver. The mills manufacture box board.

James H. Thompson, assistant manager of sales of the Pejepscot Paper Company, with offices at 42 Broadway, New York City, died on January 19 after an illness of several

Felt Cleanliness

THE **Cleanliness** of your **Felts** is an important part of your paper making. Dirty felts give you trouble and greatly increase your cost by necessitating frequent shut-downs for felt changes and washing.

A **Felt Washer** which will clean the felt while it is running will greatly increase the efficiency of your plant. The Lansing Felt Washer will do that.

The **Felt** will be **kept soft.**

The **Life** of the **Felt** will be **Increased.**

The **Quality** of the **Sheet** will be **improved.**

Greater Production will result as the necessity of shutting down for felt washing will be practically eliminated.

The washing is done in nature's own way, with plain water.

Representative mills all over the country are now using this washer with satisfactory results.

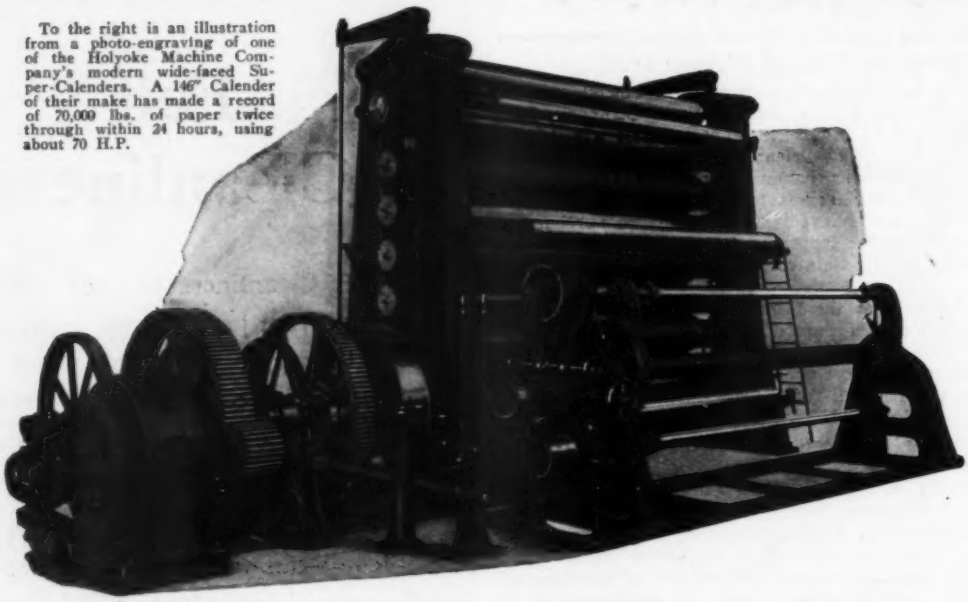
May we tell you more about it?

GILBERT J. SCOFIELD COMPANY, INC.

683 Broadway

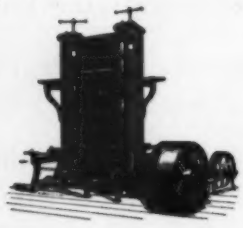
ALBANY, N. Y.

To the right is an illustration from a photo-engraving of one of the Holyoke Machine Company's modern wide-faced Super-Calenders. A 146" Calender of their make has made a record of 70,000 lbs. of paper twice through within 24 hours, using about 70 H.P.



BUILT-TO-ORDER

By HOLYOKE



Superior Engineering Skill is part of the design and construction of every HOLYOKE machine. So much so, that while different installations may resemble one another in type, yet each machine is "Built-to-Order" in a very real sense. Special details, changes, and improvements are carefully included to meet the exact requirements of local conditions. When planning on new equipment or replacements write HOLYOKE Engineers, HOLYOKE Machine Co., HOLYOKE, Mass.

Since 1863

The print above is from a larger original wood cut of a HOLYOKE 36" Web Calender installed over fifty years ago. Constant improvements in stride with the times, plus high and unwavering standard of high quality account for the LEADERSHIP of HOLYOKE.

Manufacturers of Super-Calenders, Platers, Cotton and Paper Rolls, Washing and Beating Engines, Wood Pulp Grinders, Barkers, Chippers, Rag and Paper Dusters, Rag Cutters, Hydraulic Pumps and Presses, Hercules Water Wheels and Governors.

The HOLYOKE MACHINE COMPANY

FOUNDED 1863

months. Mr. Thompson was a well known figure in the metropolitan paper trade, having spent 35 years in the paper business, starting with the old firm of W. H. Parsons & Company. He was a man of admirable character, and his genial disposition made him numerous friends. He resided in Ramsey, N. J., where the funeral services were held on January 22. A widow and four children survive.

The Strehl-Otens Company, Inc., dealer in and mill agent for paper boards of 200 Fifth avenue, New York, announces that it has added a new department for the sale of all grades of chemicals for paper and board mills under the management of James A. Kilcommons, who has had over ten years' experience in the chemical line.

The report of the United Paperboard Company, Inc., with main offices in New York City and board mills throughout the country, for the six months ended November 24, 1928, shows profit of $233,278 after expenses but before depreciation and Federal taxes, comparing with $407,946 after expenses and Federal taxes but before depreciation in the corresponding period of 1927. Stock outstanding consists of $1,317,200 six per cent preferred, and 120,000 shares of par $100 common stock.

❖ NORTHERN NEW YORK ❖

Bates Valve Bag Taken Over by St. Regis

A transaction which has been rumored for some time has just been officially announced, the acquisition by the St. Regis Paper Company, Watertown, N. Y., of the Bates Valve Bag Corporation, Chicago.

The St. Regis company is controlled by the Carlisle interests and owns eight plants in the State of New York. The Bates Valve Bag Corp. has originated and developed a patented system for the manufacture of multi-wall sewed-end paper valve bags, also patented automatic machines for packing the bags, and with its subsidiaries operates nine plants in the United States and Canada.

It is reported that the Bates company will be operated as a subsidiary of the St. Regis Paper Co., continuing the name of the Bates Valve Bag Corp.

Forestry

George W. Sisson Jr., of the Racquette River Paper Company, Potsdam, N. Y., made a plea for the utilization of all available land for reforestation at the 22nd annual farm and home week convention held at Cornell University, Ithaca, under the auspices of the State College of Agriculture and Home Economics. Mr. Sisson recommended a state survey of forest resources to not only reduce present timber wastes but to find or establish industries that will use the material.

Members of the reforestation advisory committee of the Onondaga County Farm Bureau has for its goal the planting of 200,000 trees in the county this year.

Designed to encourage counties to acquire lands suitable for reforestation and creat county forests, a bill has been introduced in the New York state legislature providing state aid to such counties not exceeding $5,000 per year. Senator Hewitt is the author of the bill. Jefferson County and several other counties have already made appropriations for the purchase of lands to be reforested to create county forests. A provision in the bill states that the State shall supply trees free of charge from its nurseries to the county.

The claims of the Brown Company of Portland, Maine, amounting to $5,955.66 against the bankrupt estate of the Diana Paper Company, Harrisville, N. Y., has been thrown out of United States District Court by Judge Frederick H. Bryant. As a result, the claimant will not be allowed to participate with other creditors in the dividends unless a higher court reverses the decision. An appeal will be taken by attorneys for the claimant. On March 26, 1927, the Di-

ALLIGATOR
TRADE MARK REG. U.S. PAT. OFFICE
STEEL BELT LACING
The famous name in belt lacing
For nearly twenty years, the name Alligator Steel Belt Lacing has meant —extreme strength; serviceability; easy, rapid application. It has meant a simple, smooth, separable joint; protection of belt ends in a clinched grip of steel; uniformity of steel used and of finished product. Every point desirable. Genuine Alligator Steel Belt Lacing has them all.
JUST A HAMMER TO APPLY IT
Made only in America. Sole Manufacturers
FLEXIBLE STEEL LACING CO.
4675 Lexington St., Chicago
In England at 135 Finsbury Pavement, London, E. C. 2
Look for the name Alligator Steel Belt Lacing on the box cover, and the familiar Alligator stamped on the lacing

LAWRENCE "VORTEX" CENTRIFUGAL PUMPS

Built for Every Need in the Paper Industry

DAY IN—DAY OUT PERFORMANCE
THAT'S WHAT COUNTS

A NON-CLOGGING PUMP that will handle your stock of high consistencies with unusual efficiency. Delivers a steady flow of stock faster, more efficiently, will not clog, and requires no attention.

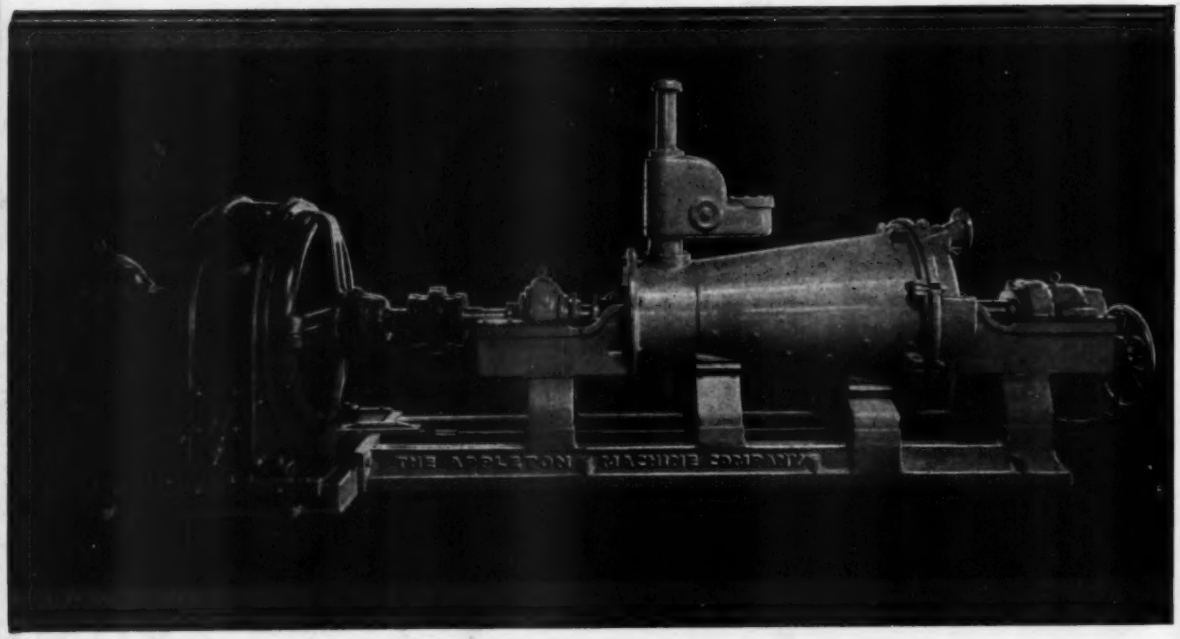
Rugged construction throughout. Heavy shaft. Oversize heavy duty Ball Bearings guarantee long life with least attention.

Our Engineers are always ready to help you with pumping problems. Write for Bulletins.

Lawrence Pump & Engine Co.
P. O. BOX 70,
LAWRENCE, MASS.
New York Office:—90 West Street

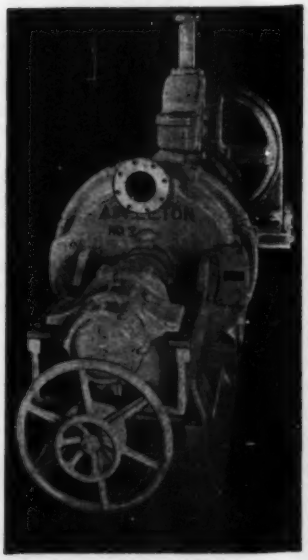
THE PAPER INDUSTRY HAS

A FINER JORDAN



The paper industry has a finer Jordan, giving finer results. The Appleton Ball Bearing Jordan quickly demonstrated its superiority in performance over older types of Jordans. It reduces operating and maintenance costs to the minimum while quality and production of output are greatly improved. The shaft turns easily on the ball bearings, reducing power consumption. The plug is permanently centered in the shell, assuring uniformly refined stock of improved quality. Plug and shell knives give much longer service. A wide range of adjustment is possible and can be accurately controlled. Vibration is eliminated. For the paper-maker the Appleton Ball Bearing Jordan is a tool of the utmost accuracy and economy with which to prepare his stock.

THE APPLETON BALL BEARING • JORDAN •



THE APPLETON MACHINE COMPANY

Appleton, Wisconsin

ana Paper Company was adjudicated a bankrupt. Failure of the Brown Company to file its claims within the six months required by law was the basis for the decision.

Charles W. Valentine, president of the Bagley and Sewall Company, Watertown, N. Y. paper manufacturers, has been granted a patent on an expansion joint which he has assigned to the Bagley and Sewall Company.

For the first time in four years, there will be a log drive on the Racquette River this spring. The drive will start above Higley Falls, N. Y. and will end at Hewittville. The drive will consist of about 15,000 cords of pulpwood and a million and a quarter feet of lumber. The pulpwood will go to the Racquette River Paper Company's mills, while the lumber is for the A. Sherman Lumber Company.

❖ WISCONSIN ❖

Mills Increase Efficiency

Increased production, lower costs and waste prevention have been accomplished to a remarkable extent by Wisconsin paper mills in their efforts to stem the competition brought about by changing conditions. There has been a constant shifting to lines which are not so easily affected by proximity to raw materials. The result has been a constant decline in newsprint and an increase in the tonnage of glassine and greaseproof papers, strawboard, corrugated board, coated papers, specialties, napkins, crepe and cellucotton.

Seven mills, during the last year, have built new boiler plants and have installed automatic pulverizing and stoking machinery, more powerful boilers, and steam turbines. This has been one marked source of economy and efficiency. Quite a number of changes have been made in mill machinery also, with the same tendency in mind. The largest of these were: Consolidated Water Power and Paper Company, with a new bleach plant and finishing room and alterations for book paper manufacture; Nekoosa-Edwards Paper Co., new equipment to make kraft paper exclusively; Interlake Pulp and Paper Co., new plant with nine digesters; Rhinelander Paper Company, with new 140-inch glassine machine.

Millions have been invested during the year to keep the mills from falling behind in the race to stay in the markets. For this reason, the outlook for production is the best it has ever been. Sales likewise are expected to maintain a steady growth, because economical production costs act as an offset to price cutting tendencies and prevent so much of the profitless prosperity which has characterized the past.

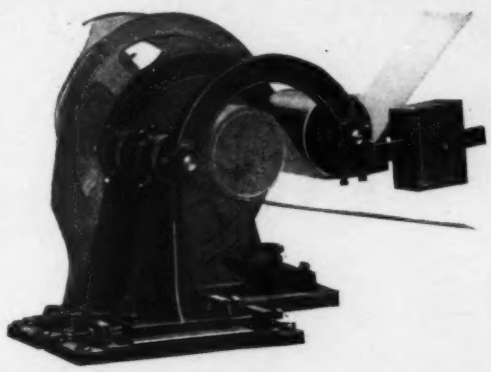
Organize Company to Make Board From Peat

Efforts have been renewed for the establishment of a plant in which to manufacture wall board, cartons and roofing out of peat. The Roth-Grahn Company was established for this purpose some time ago but a new corporation has been organized in its place known as the Peat Products Company. Capital stock is $300,000, with $200,000 common and $100,000 preferred.

The city of Portage, Wis., is being considered strongly as a location for the plant. The company has options on 1,000 acres of peat bog in that vicinity, and the railroad conditions are favorable there.

No statement has been issued by officers of the company as to the nature of the process by which they hope to utilize peat for paper or board purposes. Their efforts are being watched with interest, however, in order to learn whether the vast waste areas of peat at last may have some value. It is stated, however, machinery has been designed that will produce a fibrous pulp which can be pressed into a very durable type of board. The equipment has been ordered and arrangements already made for a market for the products.

Officers of the company are: William Grahn, Westfield, Wis., president; O. E. Huebner, Portage, Wis., vice president, and W. L. Wolfert, Oxford, Wis., secretary. C. F. Mahnke



Harness the Full Power of Your Motor Drive With the U. G. Automatic Belt Contactor.

SAVE—
BELTS
BEARINGS
FLOOR SPACE
POWER AND UPKEEP

It assures maximum tractive effort in minimum space. The motive power can be harnessed to its load in much less space than for an open belt drive and the arc of contact greatly increased, giving more driving power. The belt cannot slip and there is less wear on belt and less strain on bearings.

Why not investigate the economical advantages of the U. G. Automatic Belt Contactor. Our engineers will be glad to cooperate. There will be no obligation.

THE T. B. WOOD SONS CO. LINE

includes Shafting, Hangers, Couplings, Flexible Couplings, Rope Drives, Friction Clutches, Pulleys, Pillow Blocks, Belt Contactors, "V" Belt Drives, Conveyors and Ball Bearing Equipped Units.

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624 Main St., Cambridge, Mass.

Over Fifty Years

Experience in the manufacturing of wires for American and Foreign paper makers and the ever increasing use of Appleton Wires testify to their quality.

Looms of our own design, wire drawn in our own plant to specifications derived from exhaustive research, and carefully trained operators make this high quality possible.

Appleton Wires
are good wires
APPLETON WIRE WORKS INC., APPLETON, WIS.

is the assistant secretary, and is active in establishing the plant.

A. N. Strange Leaves Wolf River

A. N. Strange, of Neenah, Wis., who has been devoting his time for several years to the upbuilding of the Wolf River Paper and Fiber Co., of Shawano, Wis., has resigned as general manager. He has not announced his future plans.

Mr. Strange and his associates purchased the Shawano mill in 1916 and have made it an important unit in the paper mill production of the Fox River Valley. His duties have been delegated to C. F. Naber, who was elected secretary and treasurer at the annual meeting. F. W. Humphrey is president, August Anderson is the vice president, and P. J. Ladd and E. J. Dempsey are the additional directors.

Safety Schools Give Training in First Aid

Safety schools at Appleton, Wis., now include training in first aid under the expert guidance of A. Findeisen, State mining engineer. Eight industrial plants, most of them paper mills, have enrolled men in the class and twenty are taking the course. These men will be the official first aid squads for these plants.

Attendance and interest in safety are on the increase. The weekly classes in Appleton have 392 enrolled, including foremen, safety executives, and employees. Recent speakers have been F. H. Rosebush, of the Nekoosa-Edwards Paper Company, Port Edwards, Wis., and L. A. Crittenton, sales manager of the Kimball Piano Co., Chicago. The former stressed instruction among new employees, and outlined dangers that lurk in paper mills, and ways to remove the hazards. Mr. Crittenton advocated removal of the confirmed knockers who constantly belittle safety efforts.

The Kimberly-Clark Corporation, Neenah, Wis., continues to pay out five dollar checks as a tangible reward for continuous safety. The latest payment was made to 102 employees of the Badger-Globe mill, where the departments had a record of operation without a lost time accident.

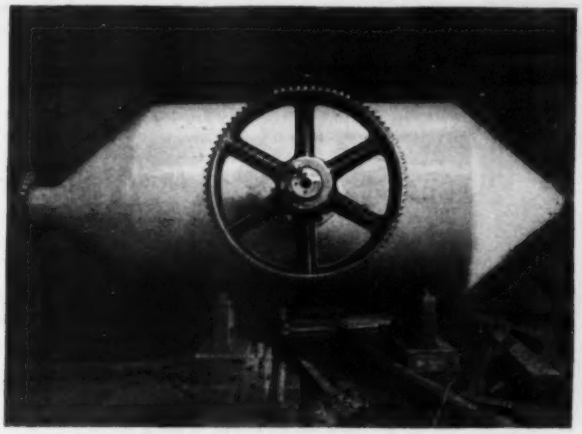
Severance Tax Law Constitutional

Reforestation which has been started on an extensive scale by several paper mills in Wisconsin can go on unhampered as the result of a decision rendered by the state's attorney declaring the new severance tax law constitutional. It permits lands to be set aside for tree growing, with a tax of ten cents an acre annually by the owner and a like sum paid to the counties by the State. A tax based on the market value of the timber is levied at the time it is cut.

Reports compiled by the Wisconsin Conservation Commission indicate that the greatest enemy of forest preservation, the forest fire, is being brought under control. The number of fires was reduced in 1928 to 430 in eleven forestry districts in which there is timber covering 13,000,000 acres. The areas burned over constituted about 45,000 acres of lands, most of it cut-over marsh acreage. May of last year was the worst period, seventy per cent of the fires occurring during that time, when there was a pronounced dry spell. Another million acres will be added to the fire protection zones this year.

Airplane travel will be a popular feature of the tenth annual convention of the American Pulp and Paper Mill Superintendents Association June 6 to 8, at Wausau, Wis., according to plans announced by R. H. Kelly, general chairman. Several delegations have indicated that they will make the journey by plane. A fleet of fourteen planes will be available to visitors at Wausau, enabling them to visit paper mills in any part of Wisconsin within a few hours' time. Wausau itself has one of the best airports in the State, and most other cities in the paper manufacturing areas are well equipped for landing and service.

Benefits paid out by the Mutual Benefit Association of the Kimberly-Clark Corporation, Neenah, Wis., during the last year amounted to $46,316.57, according to the 1928 report.



KELLOGG
Forge and Hammer Lap Welded
DIGESTER

Length 26'0" Diameter 9'9"
Shell 1 1-8" thick

PICTURED above is one of four Kellogg Forge and Hammer Lap Welded Rotary Digesters recently completed for the Brown Paper Mills Company, West Monroe, La. Each digester was furnished with charging nozzle, blow nozzle, cone heads and cast steel trunnions.

Among other Kellogg installations in the South are the following:

Bogalusa Pulp & Paper Co.	8 Units
Calcasieu-Sulphate Paper Co.	2 "
Champion Fibre Co.	5 "
E-Z Open Bag Co.	2 "
Southern Paper Co.	8 "

All Kellogg Digesters conform to the specifications of the Unfired Pressure Vessel Section of the A.S.M.E. Boiler Construction Code, and fulfill all insurance requirements.

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POWER PLANT PIPING . . FORGE WELDED PIPE . . BOILER DRUMS HEADERS . . RECEIVERS . . SEPARATORS . . FLANGED JOINTS AUTOCLAVES . . DIGESTERS

ALL KELLOGG FORGE AND HAMMER WELDED PRODUCTS ARE INSURABLE

ARTESIAN BOND *a rag-content, loft-dried, hand-sorted bond, of unusual brilliancy of color*

ARTESIAN BOND, like all other WHITING-PLOVER papers, is made with the purest spring water, assuring the utmost uniformity of printing quality and appearance.

ARTESIAN BOND *is made at Stevens Point, Wis., by*

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PATTEN PAPER CO., Ltd.

Manufacturers of

SPECIALTIES

and High Grade Printing Papers

JUDSON G. ROSEBUSH, *Pres.*
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ERIC D. LINDBERG, *Sec'y.*
STEPHEN C. ROSEBUSH, *Treas.*

Mills at

Appleton and Kaukauna, Wisconsin

Office: Appleton, Wisconsin

Employees paid into the fund $41,411.14, and the organization has a net surplus now of $19,338.57.

Recent promotions at the Kimberly-Clark Corporation are: Henry G. Boon, mill manager at Kimberly, Wis., to technical staff superintendent; Joseph Doerfler, electrical superintendent at Kimberly to manager of the Kimberly mill; William Kellett, manager of the Neenah, Wis., group of mills to the technical staff; Fred W. VanLiew, superintendent of the converting department at Neenah to manager of the Neenah mills. One retirement is announced, that of William Mehring, millwright in charge of boiler maintenance at Kimberly. He was employed by the company for 41 years.

Consolidated Water Power and Paper Co.

At the annual meeting of the Consolidated Water Power and Paper Co., Wisconsin Rapids, Wis., reports indicated highly successful operation during the year 1928 and an encouraging outlook was expressed by George W. Mead, president. All officers were re-elected.

Practical elimination of the beater room has been accomplished by this company in converting its main mill at Wisconsin Rapids from newsprint to groundwood book paper manufacture. The bleach plant and finishing room are completed and the change-over will be made immediately. Beadle mixers made this possible. These have been installed on machines 1 and 2 and were built especially for the purpose by the Nekoosa Motor and Machine Company. It was found that there is no need for an additional chest to equalize density. Washups and changes of orders are simplified and one operator on a shift can take care of the furnishing for two large paper machines, in addition to running the color.

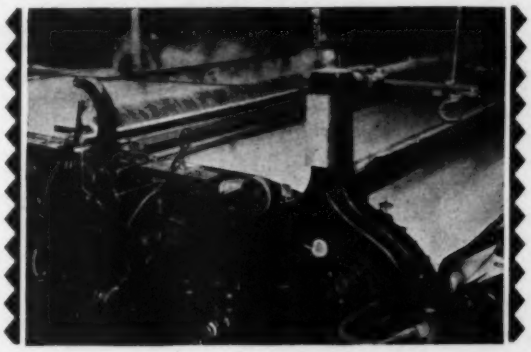
Mitscherlich sulphite pulp is now being produced in the new digester plant of Interlake Pulp and Paper Company Division at Appleton. The change-over was made early in February and operation is now proceeding smoothly under the direction of C. K. Boyer, manager. Production has been increased gradually up to the full capacity of 90 tons daily. This new plant with its nine large digesters was built at a cost of approximately $450,000. In outward appearance it is one of the most beautiful industrial plants in the vicinity.

Tariff News

In a brief filed with the United States Supreme Court, paper mills of Wisconsin are endeavoring to enforce a twenty per cent reduction in rates for coal shipped on southern railroads to lake ports. In so doing, they are hoping to keep down the cost of coal delivered to the mills, since most of it comes to Wisconsin by boat to Lake Michigan ports. The Interstate Commerce Commission has insisted that it has a right to prevent the reduction in rates. The brief points out that dock coal constitutes the natural fuel supply of Wisconsin and that the mills are entitled to enjoy all possible reductions in transportation charges. C. R. Hillyer is representing the mills in the action.

Some relief also is evident in reducing rates on paper shipped from Wisconsin to the southwestern territory so that shipping costs will be equalized with those of other sections now having advantages. An examiner for the Interstate Commerce Commission indicates that Chicago shipments east of the Neosha-Laredo line will be nine cents below the rate from Milwaukee on first class freight. Previously the rate was 20 to 30 cents above the Milwaukee territory. Most of the shipments are fifth class, and the adjustment will mean an increase of only two cents a hundred pounds.

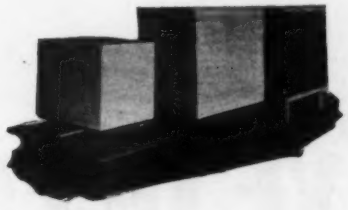
Tariff adjustments also are sought by Wisconsin mills. A plea was made in Washington recently by D. C. Everest, vice president and general manager of the Marathon Paper Mills Co. for a higher tariff on paper so as to protect American industries. Mr. Everest was speaking also for the American Paper and Pulp Association, of which he was president. A similar plea on behalf of the wire industry was made by John D. Watson, secretary and manager of the Wis-



ONCE FORMED —IT STAYS!

DURING the short time that stock is on a Fourdrinier Wire, the fibres form a structure which is never after changed and which determines the character and quality of the sheet.

You can assure the proper formation of your paper by dewatering it on a smooth, level Tyler Fourdrinier Wire.



Tyler wires run straight and true—avoiding any possibility of wrinkles or looseness and assuring an even, uniform spread of pulp.

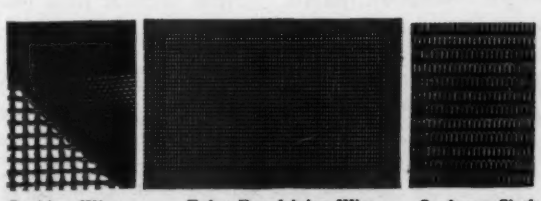
The accurate mesh provides uniform drainage and a sheet free from thin spots, holes or wire marks.

Tyler wires are quality wires.

Supplied in all widths up to and including 234 inches

The W. S. TYLER COMPANY
Cleveland, O.

TYLER WIRES



Backing Wire Tyler Fourdrinier Wire Corduroy Cloth

"The VALVE WE'VE BEEN LOOKING FOR"

—and that's the thought of many users of valves—and who have now installed Barker Quick Opening Valves

Barker Quick Opening Valves are full opening—the opening area is equal to that of the pipe drain which provides a full area passage for stock. A 6″ valve has 6″ capacity, so why buy a 6″ valve with a capacity of 4″?

And the all steel extra light handle is so made that it can be bent for unusual positions. It is attached to the valve. It cannot fall off. This is a real advanage for overhead lines. To provide against leakage on angle or overhead positions, this valve has a special packing arrangement so that the least amount of friction is developed against action of rotor.

Write for complete details. Send us your pipe line sizes—we'll gladly quote prices.

Green Bay

GREEN BAY BARKER, MACHINE & TOOL WORKS

Machinery Manufacturers

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BARKER QUICK OPENING VALVES

consin Wire Works, Appleton, Wis. He requested that the rate on fourdrinier and cylinder wires be made dutiable at from 45 to 75 per cent. Cheaper foreign labor has seriously affected this industry, he declared.

Production changes are being made at the Marinette and Menominee Paper Company, Marinette, Wis., according to announcement of W. W. Hinnenthal, general manager. The company will soon market improved grades of white sulphite papers, including wrapping, bag and tissue papers. The mills have been operating at maximum capacity for some time and have orders enough booked ahead so that there will be a possible increase in production this year. The printing department has been enlarged, and other improvements possibly may be made this year, although the plans are not definite, Mr. Hinnenthal declares.

Consolidated net income of the Eddy Paper Corp., controlled by the Kieckhefer Container Co., of Milwaukee, Wis., was $136,815 for the year ended Dec. 31, 1928, equal to 83 cents a share on the 165,000 shares of no par common stock, according to a recent announcement. This is less than half the 1927 earnings, which were $317,784 or $1.93 a share based on 165,000 shares. Operating income for 1928 was $556,104, compared to $860,472 in 1927 and total income was $601,735 against $928,935 the year before. The company has plants at Three Rivers and White Pigeon, Mich., and one in Milwaukee. J. W. Kieckhefer is president of the company.

The American Lace Paper Co., Milwaukee, Wis., will erect a four-story plant on the Port Washington Road, according to company officials. The building will be constructed of brick and reinforced concrete and have a base measuring 82x320 feet.

❖ PACIFIC COAST ❖

WASHINGTON

Crown Willamette to Enlarge Camas Plant

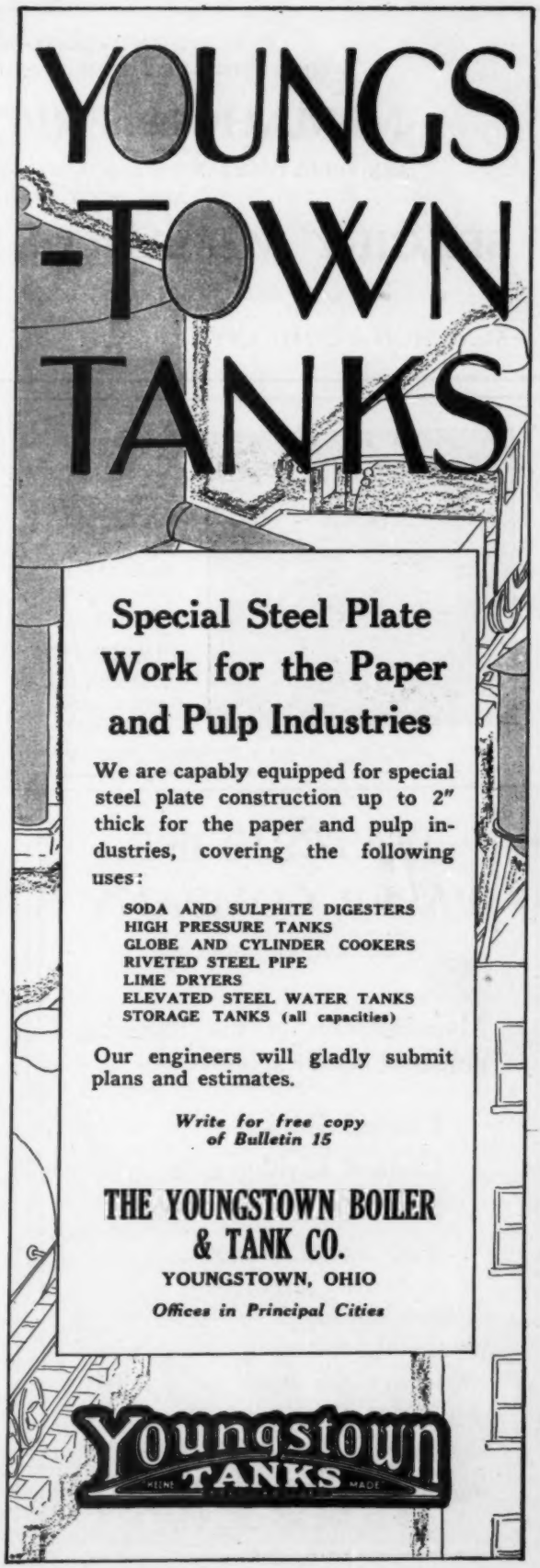
A development program which will extend over a period of from eight to twelve months and which will include the construction of new additions and the installation of new equipment at a cost of more than $3,000,000 is being planned by the Crown Willamette Paper Co. at its Camas plant, according to information just received.

Included in the major improvements and additions to the mill will be the construction of a large bleached sulphite plant; addition of one more paper machine and general improvements on several of the present paper machines; substantial additions to the sulphite digester equipment; construction and equipping of a converting plant for paper towels and similar products; additions to the present beater room; added hog fuel boiler and major repairs to present boiler plant; construction of a new wood mill; additions to the pumping and filtering equipment for the mill water supply; addition of a dozen or more new high speed bag machines.

It is said that when the development program has been completed the Camas plant of the Crown Willamette Paper Co. will be one of the most modern and best equipped specialty paper plants on the continent, as well as one of the largest. V. D. Simons company of Chicago will handle the construction and engineering work.

A tract of about 1,700 acres of timber land has been purchased as a reserve supply by the Washington Pulp and Paper Corporation which operates a 270 ton newsprint mill at Port Angeles. This stand of timber was bought from the Bradley estate in Clallam county, which is in the most northwesterly point in the United States at Neah Bay.

A bond issue of $1,500,000 for the purpose of general financing and increasing the output of the Longview Fibre


YOUNGS
-TOWN
TANKS
Special Steel Plate Work for the Paper and Pulp Industries
We are capably equipped for special steel plate construction up to 2" thick for the paper and pulp industries, covering the following uses:
SODA AND SULPHITE DIGESTERS
HIGH PRESSURE TANKS
GLOBE AND CYLINDER COOKERS
RIVETED STEEL PIPE
LIME DRYERS
ELEVATED STEEL WATER TANKS
STORAGE TANKS (all capacities)
Our engineers will gladly submit plans and estimates.
Write for free copy of Bulletin 15
THE YOUNGSTOWN BOILER & TANK CO.
YOUNGSTOWN, OHIO
Offices in Principal Cities
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TANKS

AFTER MANY YEARS OF DEPENDABLE SERVICE
WITH MAXIMUM EFFICIENCY AND A MINIMUM OF REPLACEMENTS

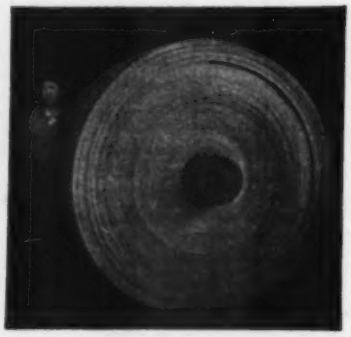
McMAHON FRICTION CLUTCHES

ARE BEING CONSTANTLY SPECIFIED BY PAPER MILLS ON THEIR NEW MACHINES
ALSO IN OVERHAULING OLD DRIVES

SPECIFY McMAHON FRICTION CLUTCHES

AND ELIMINATE STOPS AND FREQUENT REPLACEMENTS

McMAHON & COMPANY WORCESTER, MASS., U. S. A.



Quaker Conveyor Belts

are sturdy, flexible, dependable and long-wearing

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Here is an
Electric Hoist
that makes a Chain Block seem an extravagance.

ROEPER Type "R" Hoists are built in capacities from 500 lbs. to 4000 lbs. with or without trolleys—Cord or Push Button Control.

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Roeper Crane & Hoist Works, Inc.
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WATERVLIET PAPER COMPANY
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Manufacturers of the following grades of Book Paper—

Coated Book
Coated Lithograph
No. 1 Machine Finish
Tub Sized Offset

Supplied from a manufacturing plant of the highest possible efficiency; the result of a newly completed expansion program that required the expenditure of a million and a half dollars.

WOOD

TANKS

Made to Order

No tanks carried in stock—all tanks made to order for your special purpose.

We have been building tanks for over fifty years and have particular knowledge of paper mill men's requirements.

The Hauser-Stander Tank Co.
CINCINNATI, OHIO

"We Win With Quality"

Company is to be arranged by that concern. A mortgage on the property to the first Wisconsin Trust Company at Milwaukee, Wis., and George B. Ruhman of the same city to the amount of $5,000,000 has been recorded, it is reported.

Another Union Bag & Paper Corp. Plant

The last issue of THE PAPER INDUSTRY contained an article describing the new kraft pulp mill of the Union Bag & Paper Corp., which has just begun operation at Tacoma, Wash. Now comes the announcement of the completion of the company's bag factory at Vancouver, Wash.

Rather east of the town of Vancouver, on the line of the Northern Pacific Railroad, and right on the northern bank of the Columbia, are located the Columbia River Paper Mills of the Leadbetter interests. It is on these premises that this new plant has been erected. Ocean-going bottoms find deepwater dockage at the mill and sidings give access to the railroad systems of that general section of the country.

The source of the paper for the new bag plant will be the mills on whose property the factory is erected. The kraft paper, moreover, is being made of the pulp from the Tacoma plant.

W. W. Griffith, who has the record of having held responsible positions in both the operating and sales ends of the corporation's work, will function as business manager of all the company's interests on the Pacific Coast, having the general supervision of the Tacoma pulp mill, the Vancouver factory and the selling force, with offices at Tacoma. G. S. Brenzel, who was formerly connected with Union's factory at Kaukauna, Wis., will be resident manager at Vancouver, and V. H. Murchie, who was superintendent of the factory at Kaukauna, will be general superintendent at Vancouver.

Preparatory to the construction of the sulphate pulp plant for the Willapa Pulp and Paper Company at Willapa harbor near South Bend and Raymond, clearing operations began on February 19. This mill is being constructed on the site of the old Columbia Box Co. yards, the kilns and mill having been left intact. It is the intention of the Willapa concern to erect a 100 ton capacity mill and immediately following the clearing, pile driving began, 1500 pilings having been shipped in to support the two buildings, one 600 feet long and the other 450 feet long. The Butz Bros. of Menlo were awarded the contract for logging operations and the Willapa Construction company the pile driving contract.

The first water-borne shipment from the Union Bag and Paper Co., Tacoma, was made on February 9 when 1000 tons of paper pulp were shipped on the steamer Lillian Luckenbach to the Union Bag and Paper Plant at Hudson Falls, N. Y. Two weeks earlier several tons of pulp was loaded from Schaeffer terminal No. 2 for New York, this having been shipped by rail from Tacoma.

The Longview Fibre Co. of Longview, has purchased the General Fibre Box Co. of Springfield, Mass., and Clarence J. Schoo, president of this concern, has become vice-president of the Longview Fibre Box Company. H. L. Wollenberg, president of the Longview company went east to handle the transaction. The eastern company had been one of the customers of the Longview concern.

The newly organized promotion department of the Seattle division of Blake, Moffitt and Towne is in charge of L. E. Hobbs, formerly with this concern at the Portland branch.

George B. Charters, formerly with E. B. Eddy Paper Company of New York, is now assistant mill manager of the Crown Willamette Paper Company plant at Camas, succeeding H. H. Coolidge who left the organization last fall to become a member of the engineering staff of V. D. Simons.

The Rainier Pulp and Paper Company is installing a new steam unit in its plant at Shelton, which will be completed about April 1.

Did It Ever Occur to You

That several scores of mills have brought about important economies thru the installation of new Dayton High Speed Beaters, or thru the reconstruction of old holland engines into Daytons?

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USED JORDANS—7-Large Jordans, some belt drive and some direct connected to motors, including motors and starters, all in good condition and at extremely low prices. If interested, write us quickly, describing your requirements. The Noble & Wood Machine Co., Hoosick Falls, N. Y.

FOR SALE—One slightly used Noble & Wood Mammoth Jordan together with 500 HP motor and coupling. It is also equipped with pulley for belt drive, if preferred. Price and particulars upon request. The Noble & Wood Machine Co., Hoosick Falls, N. Y.

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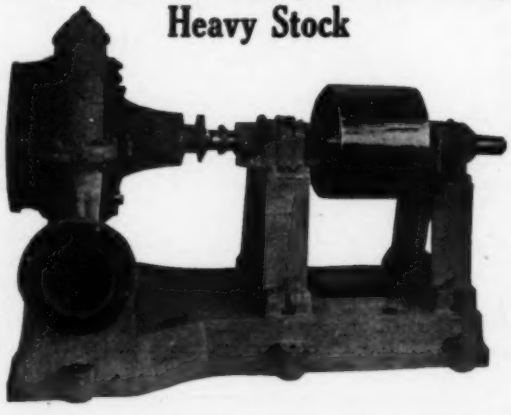

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OREGON

Pulp Mill for Reedsport

A recent report has it that the pulp mill which is to be erected at Reedsport will have its general offices at Eugene. Plans for the construction of a 60 ton pulp mill at Reedsport have recently taken on new impetus after a prolonged delay and Russell J. Hubbard, vice-president of the Winchester Bay Lumber company of that vicinity recently appeared before a special meeting of the city council asking for co-operation in securing a water supply for the contemplated project.

Mr. Hubbard's proposal was to construct a reservoir half way between Reedsport and Clear Lake, in co-operation with the city, taking water from Clear Lake, Edna Lake and Neel Lake. Part of the city system and pipeline from Clear Lake to the site of the proposed reservoir would be used jointly and the supply of water thus obtained would not only suffice to operate the mill but would furnish the city with a needed reserve, at the same time eliminating the construction of additional pipeline from the lake section to the mill site. Mr. Hubbard holds water rights on Neel lake while the city holds the filing rights on **Clear Lake.**

Spruce and hemlock are to be used in the manufacture of a high grade bleached pulp, according to the plans as presented by Mr. Hubbard. The actual construction will probably start in early spring or by summer. The construction of this mill climaxes plans that were begun several years ago, but held up awaiting developments in the pulp industry.

The mill will also use sawmill waste from the Winchester Bay Lumber Company which was constructed in 1919. John Kiernan is president of this concern, which has large holdings of spruce and hemlock timber in that territory.

Stanley W. Blanchard who was formerly with the E. B. Eddy Company at Hull, Quebec, has been made assistant mill manager of the Crown Willamette Paper Company's plant at West Linn. W. K. Reeve is the new assistant office manager, having been transferred from the California plant.

With the planting of 150,000 young spruce trees in the logged off area in the Columbia River territory belonging to the Crown Willamette Paper Co. and the planting of the same number in the Youngs River logged off area, the Crown Willamette Paper Co. has brought its reforestation program up to date and from now on, trees are being planted as the land is logged off. These young spruce trees were brought into the logged off areas in January and it is expected that planting will be completed by the first of March. The company owns approximately 4000 acres in the Youngs River district and about 2000 acres in the Seaside territory. J. H. Alker is superintendent of reforestation and the planting is being done under his direction.

Officials of the Coos Bay Lumber Company, who make their headquarters in San Francisco, Calif., are considering the construction of a pulp mill on land owned at Marshfield, according to word recently received in Portland. This concern has large timber holdings at Marshfield and could easily operate a pulp mill in connection with its sawmill there. The Coos Bay Lumber Company now has a pulp plant at Marshfield which has been idle for about 12 years, but this will be torn down and the new plant constructed within the next two years, according to present plans. At the present time, an improvement program to increase the efficiency of the yarding and shipping facilities is being carried on. Water for the proposed pulp mill would be piped in from the mountain streams.

J. B. Wilt, sulphite man, and well-known on the Pacific Coast is supervising construction of the 50-ton sulphite mill of the Sitka Spruce Pulp and Paper Co. at Empire.

The Umpqua Pulp and Paper Co., of Portland, recently moved its offices from the Bedell Bldg., to Lumbermen's Bldg.

Bell System Reduces Long Distance Rates

A reduction in day rates for toll and long distance telephone calls in the Bell System, representing a saving to the public annually of more than $5,000,000, became effective on February 1, 1929. This reduction, the third in a little more than two years, affects calls between points from 130 to 1,490 miles apart.

From five to twenty-five cents has been cut from charges for station-to-station three minute calls within the specified distances. Middle distance station-to-station rates will enjoy a reduction of as much as thirteen per cent, while an equivalent saving will be made for person-to-person service. Evening and night station-to-station rates remain at their present levels.

The well-known and old established firm of Jas. W. Pyke and Co., Ltd., has been appointed Canadian sales agent for The Kalbfleisch Corporation, one of the largest manufacturers of papermaker's chemicals in the United States.

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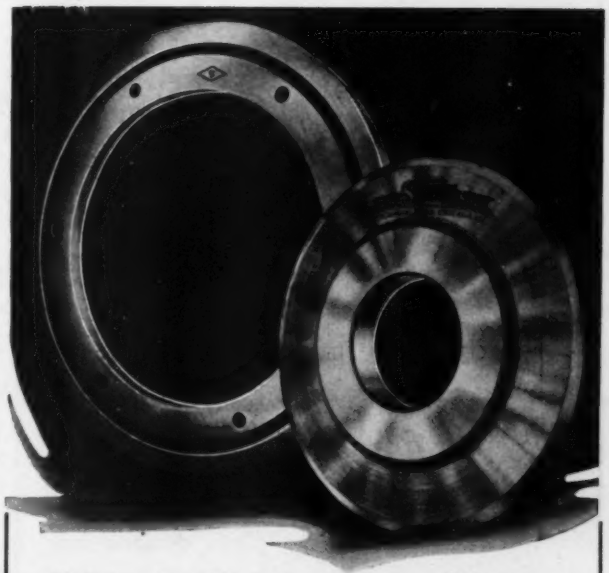

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CALIFORNIA

Crown Zellerbach Issues Stock

The Crown Zellerbach Corp., with general offices in San Francisco, recently issued 60,000 shares of preferred stock, $6 dividend convertible Series B. at $95 per share plus accumulated dividend. The purpose of the issue, was to gain funds with which to retire current indebtedness incurred in the acquisition of new properties and for other corporate purposes.

The president's statement also included the following facts: "Crown Zellerbach corporation is the outgrowth of businesses founded over a half a century ago, and, with subsidiaries, is the second largest paper manufacturer in the United States, with assets of over $105,000,000. Products of the Corporation include newsprint, sulphite and kraft wrapping paper, tissue paper, waxed papers, page bags and fruit wraps and such products as solid fibre and corrugated containers, cartons, folding and stiff boxes, paper cans, oyster pails, and the nationally known brands of Public Service Towels and No-Waste Toilet Tissue. Its wholesale divisions are agents for a full line of all grades of paper and kindred lines.

"Properties include deed ownership and timber licenses and pulp leases of more than ten billion feet of timber in the U. S. and Canada; water power developments owned and leased of 63,600 h. p. capacity; hydro-electric power development of a present installed capacity of 25,500 k. w. and long term contracts for 14,000 k. w. additional; pulp mills and paper mills having an annual capacity of 465,000 tons of paper; partly owned paper and board mills having an annual capacity of 186,000 tons of box board and box board products; converting plants and wholesale divisions."

A trip to Wisconsin pulp centers and New York is being made by Henry M. Ford, construction engineer associated with B. T. McBain of Portland. He left in January and expects to return to Portland early in the spring.

Arthur W. Towne, grandson of one of the founders of Blake, Moffitt and Towne, has recently been appointed manager of sales promotion for San Francisco and the Northern California Division. He has been advertising manager for the concern and will continue to supervise this activity.

Cutler-Hammer Announces Changes in Organization

On March 1, P. S. Jones became manager of the New York district office of Cutler-Hammer, Inc., manufacturers of electric motor control and allied apparatus. Mr. Jones was formerly manager of the company's Pittsburgh office. He succeeds C. W. Yerger, who leaves the company to accept a position with the Hanson-Van Winkle-Munning Co., Matawan, N. J.

T. S. Towle, formerly a sales engineer of the Pittsburgh office, becomes manager at Pittsburgh.

G. E. Hunt has been placed in charge of distributors' sales for Cutler-Hammer. Mr. Hunt is widely known in eastern distributing circles having been located in the Philadelphia office of the company for the past ten years.

Matthew Griswold

Matthew Griswold, who retired as manager of the Erie, Pa. works of the General Electric Company on January 1 of this year because of ill health, died at his home in Erie on February 10.

Mr. Griswold was born in Erie in 1866, and was graduated from Sheffield Scientific School, Yale, in 1888. Upon leaving college he became associated with the Griswold Manufacturing Company, of which he served as president for a number of years. On November 11, 1911, he severed his connection with the Griswold company to become acting manager of the Erie works of the General Electric Company, and shortly after made manager of the plant.

Mangrove Wood for Paper Making

According to **The Engineer** of London of Jan. 25, 1929, p. 101, in the **Bulletin** of the Imperial Institute there is a note on the use of mangrove wood for paper making. Three species of wood were tested, and the microscopical characters of the three pulps are described, while an account is given of experiments to manufacture paper from them.

In general, for satisfactory pulping the mangrove woods demand severe treatment which would be so expensive as to be prohibitive, and the papers which they furnish are very weak. The manufacture of bleached pulp would therefore be impracticable. It is considered, however, that it might be possible to prepare a coarse, unbleached pulp specially designed for wrapping-paper, but the results so far obtained are not conclusive. In any case, owing to the weakness of the material it could not be converted into papers at all comparable to kraft and Manila papers.

Baldwin Locomotive Has Interest in Whitcomb Co.

The Baldwin Locomotive Works of Philadelphia, Pa., one of the largest steam locomotive manufacturers in the world, has purchased a substantial interest in the business of the Geo. Whitcomb Co. at Rochelle, Illinois. The latter is an organization of fifty years standing and has developed a complete line of gasoline, distillate, oil, and alcohol burning locomotives for railway switching as well as industrial and contracting activities.

During the last five years, there has been an increasing demand to use internal combustion engines using gasoline, distillate and oil as fuel in the larger locomotives. The Geo. D. Whitcomb Co. has recently concluded an agreement for use, as applied to its locomotives, of a gasifying device which admits of burning a low grade fuel oil with a specific gravity as low as 32 degrees Be. This new development shows a very substantial fuel saving that will be of interest to every prospective purchaser of locomotives as the economy will approach that of the more expensive Diesel equipment.

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Industrial Engineer

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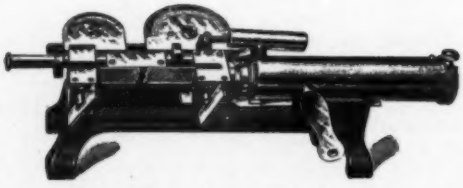
The folding test has become standard for bonds, ledgers, and Kraft papers.

Schopper Strength and Stretch Tester

Small Piece Pocket Paper Scale
By weighing a piece 2 in. by 4 in., gives basis weight 25x38, 24x36, 22x34, 500 sheets.



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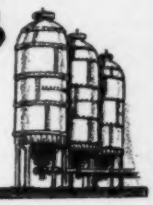


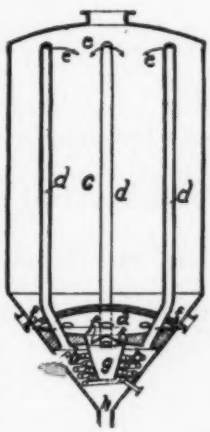
Domestic and Foreign

Cooking Sulphite Pulp

THE hot liquor is discharged with the cooked pulp from a digester into a blow pit to preheat. A second charge of chips is then washed into position in the digester. The second charge of chips is mixed with a quantity of cooking acid which has been raised in temperature by the fluid passing through the relief valve of the digester while the first mentioned charge of pulp was under cooking conditions. G. H. Tomlinson, Montreal, Canada. U. S. Pat. No. 1,697,032.

Digester with Circulatory System for Liquor

THE illustration shows a digester which is featured by a circulatory system for the liquor, which is passed through a double-walled false bottom into a heating chamber which is located underneath the false bottom. Pipes extend through the double-walled false bottom (f) of the digester into the upper chamber of the digester. These pipes are designated as (d) and open out at (e) into a spray nozzle, which distributes the liquor over the stock contained in the chamber (c). The heating chamber is shown at (b) and the liquor is constantly rising from the bottom of the digester to the top and being discharged through the riser pipes (d). The liquor flows into the heating chamber (b) through a funnel-shaped device (g) which strains out all particles of sand, dirt and the like. G. P. Kropp, German Patent No. 468,656.



Influence of Humidity on Bursting Strength of Paper

THE humidity of the atmosphere is known to have an important action on the strength of paper. Thus the bursting load or the tearing length increases as the moisture decreases, while the elongation decreases. As far as folding strength is concerned, papers differ. Hard and brittle papers increase in folding resistance as the moisture increases, while soft papers decrease.

Tests were made at the Government Testing Laboratories at Berlin-Dahlem to determine in what degree the bursting strength of paper is affected by the humidity of the atmosphere. Thirty papers of various kinds and composition were used in the tests, and these were examined at humidities of 40, 65 and 90 per cent with the Mullen testing apparatus, after they had been allowed to remain in rooms at the set humidities for four days. Various tests were made on each sample of paper so as to exclude any variations that may be due to differences in the sheets of paper. The results obtained are given in the accompanyiny tabulation.

No.	Nature of paper	Composition of paper	Aver. tear. length in mm.	Aver. elongation	Bursting strength in kg/cm.² at 65% air humidity 40%	65%	90%	
I	Normal 1	Rag	5525	5.7	4.49 (102)	4.41 (100)	4.01 (91)	#
II	Normal 2a	Rag	4425	4.2	3.06 (109)	2.80 (100)	2.64 (94)	#
III	Normal 3	Half rag, half chemical pulp	4475	3.0	2.26 (110)	2.05 (100)	1.90 (93)	#
IV	Normal 4a	Chemical pulp	3475	2.3	1.49 (103)	1.45 (100)	1.33 (92)	#
V	Packing paper 5b	60% mechanical wood; 40% pulp	3350	2.4	2.04 (105)	1.94 (100)	1.72 (89)	#
VI	Writing paper 6a	Sulphite pulp	3550	1.4	1.40 (95)	1.47 (100)	1.30 (88)	#
VII	Bag paper	Sulphite pulp	6025	3.2	3.10 (98)	3.17 (100)	3.12 (98)	#
VIII	Bag paper	Sulphite pulp	5550	2.8	2.76 (97)	2.86 (100)	2.83 (99)	#
IX	Bag paper	Soda pulp	6775	1.8	2.36 (99)	2.39 (100)	2.36 (99)	#
X	Bag paper	Soda pulp	5425	4.5	3.00 (99)	3.04 (100)	2.80 (92)	#
XI	Parchment paper	Chemical pulp	5250	2.7	1.69 (110)	1.53 (100)	1.47 (96)	#
XII	Pergamin paper	Chemical pulp	4150	1.6	1.73 (104)	1.67 (100)	1.60 (96)	#
XIII	Blotting paper	65% chemical pulp; 35% cotton	850	1.7	0.96 (113)	0.85 (100)	0.78 (92)	#

As may be seen from this tabulation, all papers tested at a humidity of 90 per cent have a lower bursting strength than those tested at 65 per cent humidity. The variation is from one to twelve per cent. No general rule can be established regarding the variation in bursting strength with air humidity. Zellstoff und Papier, 1928, pages 602.

Pure Cellulose

THE cellulosic material is first treated with sulphur dioxide, when it contains a large amount of tannin, and then with ammonia, and when it contains resins and other ammonia soluble substances, it is treated first with ammonia and then with sulphur dioxide.

When conifers, rich in resins, are being treated, then ammonia gas is conducted into the digester, filled with chips, at the bottom and enough gas is added to the apparatus until there is a strict evidence of the presence of ammonia at the top of the apparatus. The quantity of gas used depends upon the moisture content and the character of the raw material, and it may vary within the very wide limits of two to twenty per cent. When the wood does not contain sufficient moisture, then the chips may be steamed for a short time before ammonia is introduced. Then the digester is closed, in certain cases compressed or liquefied ammonia is introduced under its own pressure, and the stock is treated for some time, when necessary at an elevated temperature or with high pressure ammonia, until no acid ingredients go into solution any longer. Strong heating of the wood with ammonia injures the quality of the cellulose.

Then the ammonia is driven out of the apparatus by other volatile substances, as, for example, steam, and is recovered. It is also advantageous to lead the ammonia and steam into another digester filled with chips. The stock in the first digester is treated with wet steam in order to free it from substances which have been solubilized by the ammonia, or it is cooked with water. Sulphur dioxide is introduced into the still hot wash water and the precipitates are then removed. The tannins present in the solution can be precipi-

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MONTREAL, QUEBEC

tated by means of colloids or aluminum sulphite. After additional sulphur dioxide has been added to the liquor, it is ready for reuse. Dr. Charles Harnist, German Patent No. 469,372.

Paper from Potato Pulp Residues

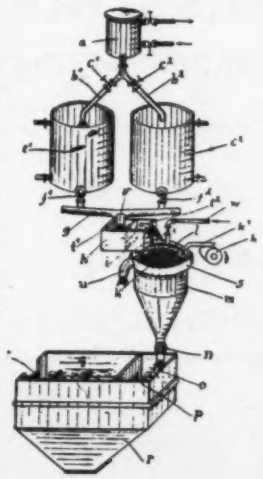
THE dirty mash which remains behind after the starch has been extracted from potatoes has been considered as a suitable material for use as a paper filler. The residues have accordingly been worked up without preliminary purification. The process has not been a practical success for the reason that a poor paper was obtained in this manner under the best circumstances. To get rid of these disabilities, the potato mash was first purified with the result that a fibrous material was obtained suitable for working up into a good paper.

The new process is somewhat as follows: The pulp was brought into a digester in the mashy state and there subjected to a temperature of 80 degrees C. for so long a time until the mass was converted into a glassy, that is, gelatinous condition. The mass was then removed from the digester and allowed to enter a fermentation vat, where it was allowed to remain at a temperature of approximately 20 to 30 degrees C. until fermentation was complete. This point was easily recognized, for at that point the mass sunk to the bottom of the vat.

Then the mass was brought upon a wire, running through water, the mesh of the wire being such that the fine fibers, stuck together with the gelatinous, adhesive substance, sank to the bottom and the coarser impurities, such as potato skin and the like were deposited upon the wire and thus carried away. It was found that these impurities amounted to about five per cent of the entire mass.

The fibrous mass, preliminarily cleansed in this manner, was then passed through an apparatus in which the sandy and earthy impurities were removed and then the fibrous mass was pumped to a dehydrating machine for further processing.

The apparatus in which this interesting process is carried out may be seen in the accompanying illustration. The mass is cooked in the digester (a) with constant agitation. It then passes from (a) through the pipe (b^1), provided with the valves (c^1) and (b^2) into the fermentation vats (e^1) and (e^2). These vats are alternately being emptied and filled. The mass then passes through the outlets (f^1) and (f^2) into the conduit (g) and then through (v) into the tank (h), which is divided into two parts (t^1) and (t^2), interconnected through the opening (i). These containers empty their contents on to the wire (k), which is held in the widened head (s) of the container (m). A circular pipe (1) provided with numerous openings is fed with water from the line (w) and the wire (k) is thus constantly sprayed with water. The wire or screen (k) is kept in motion by a reciprocating device so that the impurities are more easily removed from it. The mass flows from the container (m) through the valve (n) into the chamber (o) of the flotation device (r) and leaves through an opening for transportation direct to the paper machine. A. Ubbelohde, German Patent No. 460,837.



Winding Paper into Rolls without Cores

THE new device, which is patented by Carl Bebrich in German Patent No. 469,675 differs from the apparatus usually employed for this purpose in the fact that the supporting pair of rolls, carrying the winding roll, is held fast. The winding roll is thrown out of the machine by means of a roll which exerts pressure upon it and which can be adjusted, and which is located between one of the two supporting rolls and a smaller roller which is journaled in bearings so that it can be moved back and forth and which works together with the fixed supporting rollers. The roll of paper or the like, which is being wound without a core, is ejected from the machine just as soon as it reaches a certain size.

Figure 1 shows the arrangement of the winding apparatus and the web of paper being wound at the start of the process,

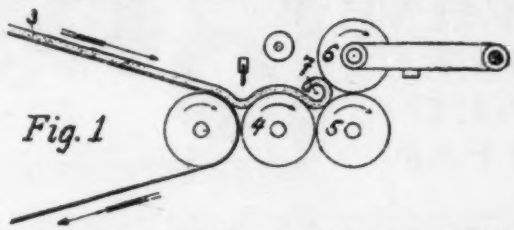


Fig. 1

while Figure 2 shows the apparatus at the end of the winding process, that is shortly before the wound paper roll is ejected out of the machine and the paper web is cut. The web of paper entering the machine, shown at (3) comes into contact with rollers (4) and (5) which rotate in the same direction as the travel of the web. It also comes into contact with the roller (6) which is also rotating in the same direction and which changes the direction of the travel of the

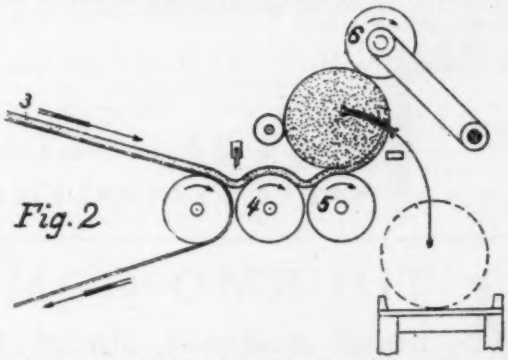


Fig. 2

paper from a horizontal to a vertical direction. The weight of the paper causes it to start to roll up within the space formed between rollers (5) and (6). Thus the paper web is rolled up into a roll without a core and finally when it reaches the right size it is ejected from the apparatus by means of the roller (6).

Woolen Felt for Pulp and Paper Webs

A WOOLEN drying felt is employed in pulp and paper machines, for the purpose of pressing the moist web against the surface of the hot drying cylinders. The felt absorbs moisture during this operation. In order to remove this moisture from the felt, the latter is passed through the felt drying device which is built into the machine. It is only when the felt is itself not saturated with moisture that it can absorb moisture from the web. The felt dryer must naturally be very hot, for the thick woolen felt does not give up the moisture that it has absorbed unless a high temperature is used. The result is that the excessively high temperatures which are used in the felt drying apparatus burn the felt very rapidly and it quickly becomes unusable.

The problem is therefore to make a woolen drying felt which will absorb the moisture readily, but which gives it up again just as readily. Moreover, the strength of the felt must not be sacrificed when this is done, and the surface of the felt must be absolutely smooth; otherwise the paper is marked.

The new felt which is patented by Weckmueller and Beinhauer in German Patent No. 465,604 fulfills all these requirements. This felt is just as smooth on the paper side as the ordinary type of felt. However, a certain number of pores or channels are located in the felt underneath the top smooth surface which lead therefrom direct to the oppo-

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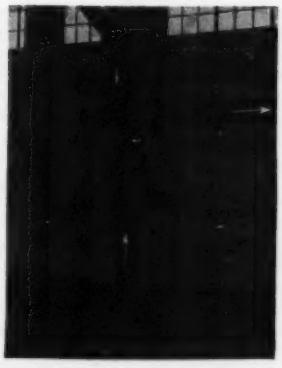

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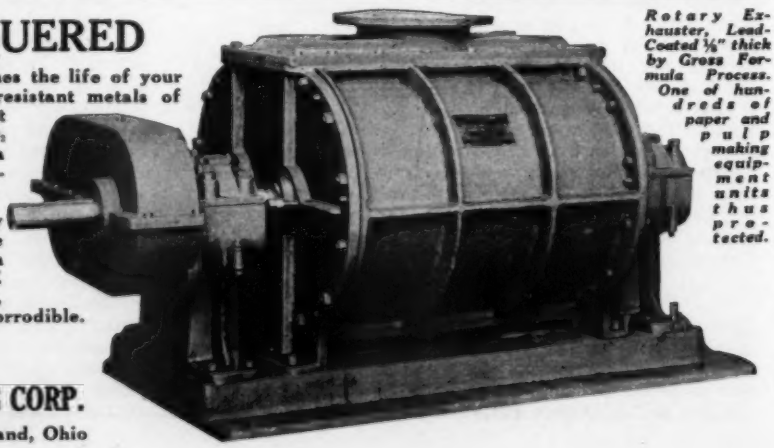

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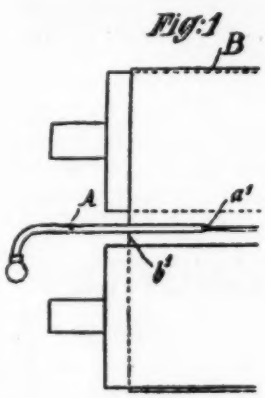
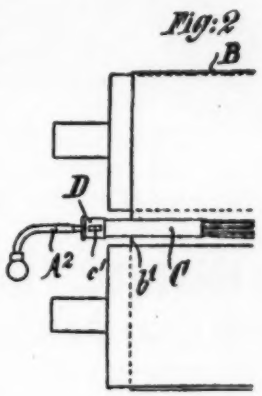
site side of the felt, where they open out into openings directly on the surface of the felt. The result is that steam and moisture can easily penetrate through the felt, which remains comparatively dry and does not rot. The excessive heating of the felt, which is necessary with the other types, is not necessary and the felt is easily and rapidly dried at lower temperatures. The new type of drying felt facilitates the operation of the machine and necessitates the consumption of less steam from the drying process.

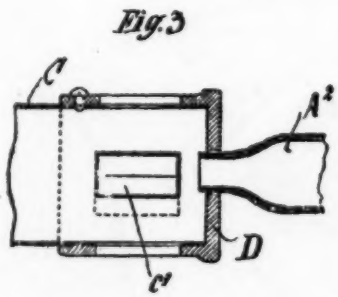
Drying Apparatus for Paper

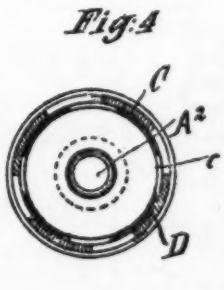
THE new apparatus is characterized by possessing a special device for removing the water vapor that is generated during the drying process. This is accomplished by means of a current of air which is directed on the surface of the paper. The new invention is particularly concerned with avoiding the difficulty which exists under these conditions in that the edges of the paper web are injured.

The nozzles (A), whose orifices are designated as (a^1), are accordingly arranged in such a manner that they extend







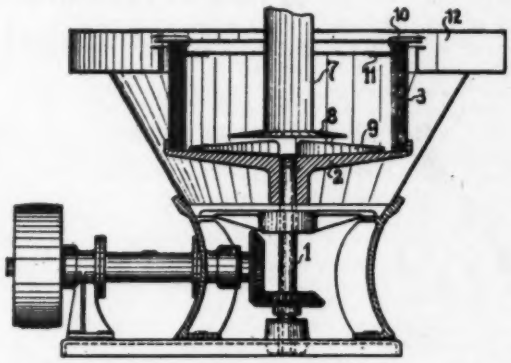


beyond the edge of the paper web (b^1). They are thus prolonged into the interior of the paper machine. The force of the ejected air does not therefore play against the edges of the paper web and injure them.

Figure 2 shows a second method of obtaining this condition. To the end of the nozzle (A^2) is fixed a sleeve (C) which extends into the space between the drying cylinders in the dry end of the paper machine. Thus, the air that issues out from the nozzle does not come into contact with the edges (b^1) of the paper web (B). The effect of the air is thus localized. The end of the sleeve (C) is provided with several openings (C^1) and these openings can be controlled by means of the regulating device (D) which acts in the same manner as the adjusting device on the common gas burner of a gas range. In this manner it is possible to adjust the flow of air through the nozzle so that it is sufficient for requirements at any given time. Thus, the vapors which are generated from the paper during the drying process are advantageously and completely removed from the neighborhood of the paper machine without injuring in any way the edges of the paper web, which it must be mentioned are the most sensitive part of the web itself. F. Grewin, French Patent No. 645,651.

Cleaning Paper Stock in a Centrifugal Machine

THIS machine is provided with closed walls. The hollow shaft (1) supports the bottom (2) of the rotating drum, whose wall (3) is firmly fixed to the bottom. The paper

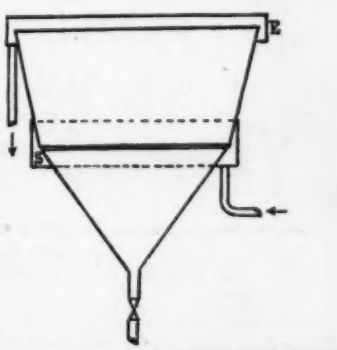


stock enters the machine through the central pipe (7), which is provided with a flange (8). The blades (9) constantly remove the paper stock from the bottom (2) of the drum and cause it to circulate rapidly around the latter. This results in the formation of a cylindrical layer of paper stock, which is forced against the wall (3) of the drum. The thickness of this layer of stock is determined by the width of the collar (1) on the upper edge of the drum wall (3).

The amount of paper stock which is fed into this machine determines the amount that is discharged from it over the collar (10). The specifically heavier parts of the stock, that is, the sand, metallic particles and wood knots, remain fixed to the wall of the centrifugal, while the specifically lighter portions are held back by the collar (11), whose outer edge has a greater diameter than that of the inner edge of the collar (10). The result is that only clean paper stock is caught in the discharging device (12), from which the stock is removed for further processing in the paper machine. The hollow shaft (1) is closed during the operation of the machine. H. Thomassen, German Patent No. 469,318.

New Type of Save-All

THERE are two characteristic features of the new type of save-all; first, reduction of the speed of the white water by leading the same into the save-all in a horizontal plane, and second, the avoidance of any internal structures within the apparatus. To accomplish this, the funnel-settling portion of the apparatus is cut through horizontally at about half its height, so as to form a slot through which the white water flows. This insures the uniform distribution of the white water over all parts of the wall. No internal structural parts are built into the funnel. Hence there is no dividing wall, no piping and the like. The concentrated stock is removed at the bottom of the funnel and the concentration is seven grams of fiber per liter of mixture. The overflow water is perfectly clear and contains no fiber values. Zellstoff und Papier, 1928, page 802.



Testing Hemp, Linen and Cotton Rag Fibers

THE various methods, which have been proposed and are used for testing these fibers, were investigated. It is claimed that none of them give good results. When the strength of the raw material is tested at zero tearing length

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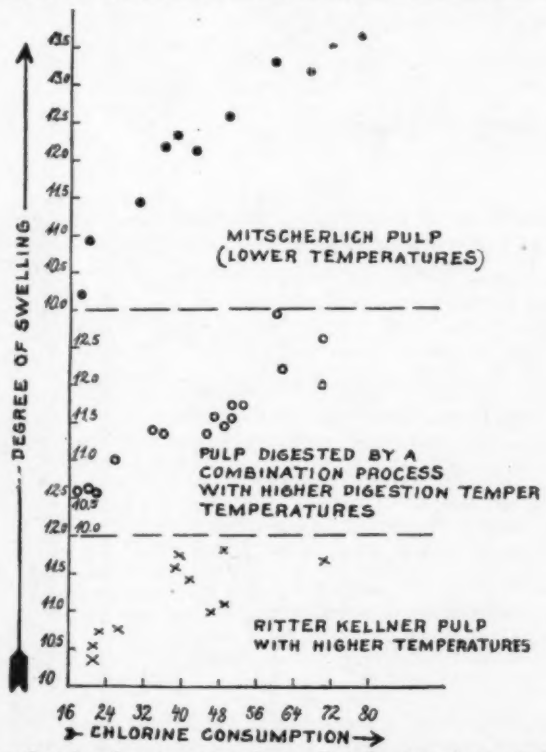
(care must be taken to see that all the fibers tear), then it is found that although the obtained results vary to a large degree, the average value nevertheless is comparative quantity. The lighter the color of the fibers, the greater the strength. It was found during the course of these investigations that it is most advisable to test the fibers over an eight millimeter span and in air which has 65 per cent humidity. The result of these strength tests were checked against the behavior of the stock in beating. It was found that the energy required in beating the stock varied in accordance with the strength of the fibers, in order to obtain a beaten pulp of a definite degree of beating. The strength testing method used is, according to the author, the one best suited for testing half stuffs. A. Fast, Bumaschnaja Promischlennost, volume 7, pages 444ff.

Determination of Hydration of Bleached Sulphite Pulp

MEASUREMENT of hydration is becoming of increasing importance in pulp and paper chemistry and technology. Measurement is made of the degree of swelling or hydration and of the capacity of hydration. Mention is made of the use made of this method in determining the degree of hydration secured in the beater. In determining the capacity of swelling or hydration, a property of the fiber is investigated. The specific capacity of a swelling is the capacity of the fiber to absorb a definite quantity of water with increase in volume.

Various methods proposed for the determination of the capacity of hydration as described in the literature are dis-



cussed and references are given. Details are given of the hygroscopic moisture method, which is claimed to be the most useful of these methods. The results that are obtained with this method are also discussed. The conclusions that are drawn from these results are as follows:

The capacity of hydration of cellulose decreases with increase in the degree of disintegration to which the cellulose has been subjected. With the degree of disintegration constant, the fiber of the cellulose which has been digested more carefully possesses the higher capacity of swelling. The capacity of swelling can be injured by the operations through which the cellulose passes on the dehydrating machine.

Hydrocellulose and oxycellulose do not possess greater capacity for hydration; rather less.

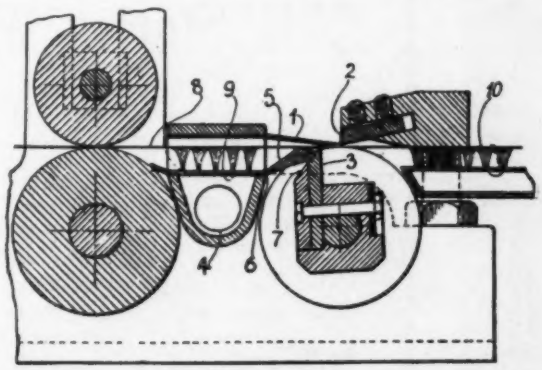
A number of pulps were prepared by different digestion processes and then tested for their hydration powers. The accompanying curve chart shows the relation between the degree of disintegration of the pulp and its capacity to hydrate. The relation between the capacity of hydration and the nature of the digestion process is also indicated on these curves. The swelling capacity of easy bleaching sulphites does not vary much and it appears to be immaterial what digestion process is employed in preparing the pulp.

Investigation was also made of the effect of hydrocellulose or oxycellulose on the swelling power of pulp. There is no connection between the degree of swelling of these substances, according to the older conception, and the power of hydration. It is pointed out that the measurement of the power of swelling or hydration may be used to control operations. Thus irregularities in the digestion of pulp will be reflected in the capacity of hydration of the pulp. Furthermore, injury to the pulp in the dehydrating machines can be traced by this property. Dr. W. Nippe, Der Papierfabrikant, 1928, pages 501-6.

Paper Web Cutter

THE new type of paper web cutter, for use on the paper-making machine and the like is characterized by possessing in addition to a stationary and a rotating knife an arrangement which moves the edges of the freshly cut paper away from the knife, while a current of air serves to divert these edges of the paper web out of the path of the rotating knife.

As seen in the accompanying illustration, the diverting device (1) works with the stationary cutting knife (2) so that the edges of the paper web are moved out of contact with



the knife (2). It has been found in practice that when the edges of the paper web are moved away from contact with the stationary knife, they are easily bent so that they make contact with the rotating knife and are cut.

According to the new invention, a pneumatic device (4) works in conjunction with the diverting device and an upward current of air is directed from the nozzle (6) so that the paper web edges are blown out of contact with the rotating knife.

It has also been established that when the web is passed through the machine, the current of air (5) which works along with the rotating knife (3) directs the paper web (8) by means of the surface (7) of this rotating knife. The oblique course of the air current changes when the rotating knife moves to come into contact with the stationary knife. After the paper web has been cut, the current of air supports the edges of the paper web and loosens it from the edge of the rotating knife.

In addition to the obliquely directed air current, air nozzles (9) and (10) are arranged on both sides of the cutting device and two upwardly directed air currents are formed, one of which supports the paper web in its upward movement while the other carries the individual strips in their movement to the winding roll. W. E. Mollius, German Patent No. 467,667.

Stories Without Words

In the land of midnight sun and noon day twilight, there is a people without an alphabet. Yet the urge of autobiography is present, and long hours of aurora-lighted leisure are spent in transcribing on some unwilling medium—a walrus tusk at best—"The story of my adventures."

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New York, March 1, 1929.

IT IS agreed generally among paper manufacturers and merchants that demand for paper, in an aggregate sense, is developing quite satisfactorily; there is, judging from all indications and according to opinion within the trade, probably as large a movement of paper into consuming channels as the industry has ever witnessed in normal times. Users and converters are absorbing supplies in a consistent manner, and there is a market existing at present which is of broad scope. Moreover, most paper mills are well engaged, and a large majority of concerns in the distributing and merchandising divisions of the trade are fairly busy. Yet the market situation is far from satisfactory.

In other words, the same condition which has prevailed for a long while and which has been outlined on numerous occasions, whereby competition of the keenest variety is serving to diminish—if not entirely eliminate—profit to the manufacturer of paper, still exists. Paper mills are turning out large tonnages of paper of various kinds, and they are marketing correspondingly big tonnages. Dealers and distributors in turn are handling sizable quantities of paper of practically all classes, and are finding a ready consuming outlet for as large an aggregate tonnage as ever before has been handled, but the margin of profit has been so pared down that the industry, both from an individual and a collective standpoint, is not realizing the profit that it should, and, therefore, the market condition is anything but satisfactory.

This situation was a subject of common discussion at the annual convention of paper manufacturers in New York in February. The matter was accorded all the consideration that it rightfully deserves at the yearly gathering of papermakers in this city, and, judging from the expressions registered by many leaders of the industry at the convention, earnest effort is being made to remedy the situation, with a view to putting the industry back on a prosperous basis in keeping with the favorable marketing conditions otherwise which it is now enjoying.

There is a good general demand for paper. Consumers in various quarters are buying in large volume, and in a steady manner indicating that they are absorbing supplies to cover definite and immediate requirements. In fact, there appears every reason to believe that demand is of the healthiest character, based on direct needs of buyers, with apparently little or no supply being accumulated in any consuming quarter. Buyers are operating in the market absorbing supplies today which they require tomorrow, so to speak, and few, if any, are piling up stocks, having grown so accustomed to purchasing in a more or less hand-to-mouth manner that they no longer consider ordering other than quantities immediately needed.

Production of paper in the United States in December last amounted to 546,620 net tons, according to identical mill reports to the American Paper and Pulp Association, compared with 599,311 tons produced in November and 617,391 tons in October. The December output brought the total for last year up to 6,965,951 net tons of all grades, showing an appreciable increase over the 6,762,942 tons produced by identical mills during 1927, a gain of about 3 per cent. Production of all grades with the exception of newsprint, hanging, and felts and building papers showed an increase in 1928 as against 1927. Book and paper board scored an increase of 6 per cent over 1927, while tissue paper gained 5 per cent, bag paper 4 per cent, writing 3 per cent, and wrapping one per cent. The output of hanging paper declined 18 per cent as compared with 1927, that of building paper was 9 per cent less, and of newsprint 5 per cent less. Stocks of paper of all kinds at mills at the end of December totaled 285,449 tons, which represented an increase of about 12 per cent over the stocks held at the end of 1927. The association makes this significant comment: "While 1928 paper production increased approximately 3 per cent over 1927, the productive capacity of the industry increased about 6 per cent. This increase was in the face of an existence of idle capacity amounting to approximately one-quarter of the total productive capacity."

Production of newsprint in the United States in January amounted to 123,822 net tons, and shipments from mills were 120,263 tons, while production in Canada was 212,191 tons and shipments 209,020 tons, according to the monthly statistical summary of the News Print Service Bureau, making a total United States and Canadian production for the month of 336,013 tons and total shipments of 329,283 tons, contrasted with a total output for both countries of 323,533 tons and shipments of 330,166 tons in December. During January, 20,648 tons of newsprint were produced in Newfoundland, and 1,882 tons in Mexico, so that the total North American output for the month amounted to 358,543 tons. The Canadian mills produced 24,342 tons more in January, 1929, than in the same month last year, which was an increase of 13 per cent. The United States output was 4,297 tons more or a 4 per cent gain, while the Newfoundland production was 2,709 tons or 15 per cent larger, and that in Mexico was 714 tons more, making a total increase of 32,062 tons, or 10 per cent, over January, 1928. During January, the Canadian mills operated at 81.9 per cent of rated capacity, United States mills at 81.8 per cent, and Newfoundland mills at 100.8 per cent. Stocks of newsprint at Canadian mills totaled 21,406 tons at the end of January, and at United States mills 38,003 tons, making a combined total of 59,409 tons, which was equivalent to 3.8 days' average production.

There was a large increase in production of paper board in the United States in 1928 as compared with the preceding year. Mills in this country made a total of 2,682,845 net tons of board last year, against 2,401,324 tons in 1927, the percentage of production to the rated capacity of mills being 78.9 per cent last year, contrasted with 71.3 per cent in 1927. December board output was 205,046 tons, against 241,924 tons in the preceding month. New orders received by mills during December called for 197,148 tons of board, compared with 248,147 tons in November, while unfilled orders held at the end of December were for 94,174 tons, against 93,203 tons a month previously. Shipments of board from mills in December aggregated 197,029 tons, contrasted with 235,228 tons in November, and stocks held by mills at the end of December totaled 55,624 tons, against 47,693 tons a month earlier.

Wrapping paper is moving freely, both against old orders and on current commitments, and prices are maintained. Book paper is steady insofar as quotations are concerned, and a fairly heavy movement, principally into contract channels, is in motion. Tissue paper is in moderately good demand, and fancy papers are being absorbed in sizeable lots. Fine papers have experienced a marked increase in demand since the beginning of the year, and it is reported that most bond and ledger mills are working at a livelier pace than in some time. Box boards are characterized by what can be described as a critical market condition. Prices remain low—so low, in fact, that it is doubted that any producer can eke out a profit on his product—and demand is subsiding as most consumers are filled up, having bought generously at the low prices prevailing since late November. No improvement whatever of a stable nature has occurred in board prices.

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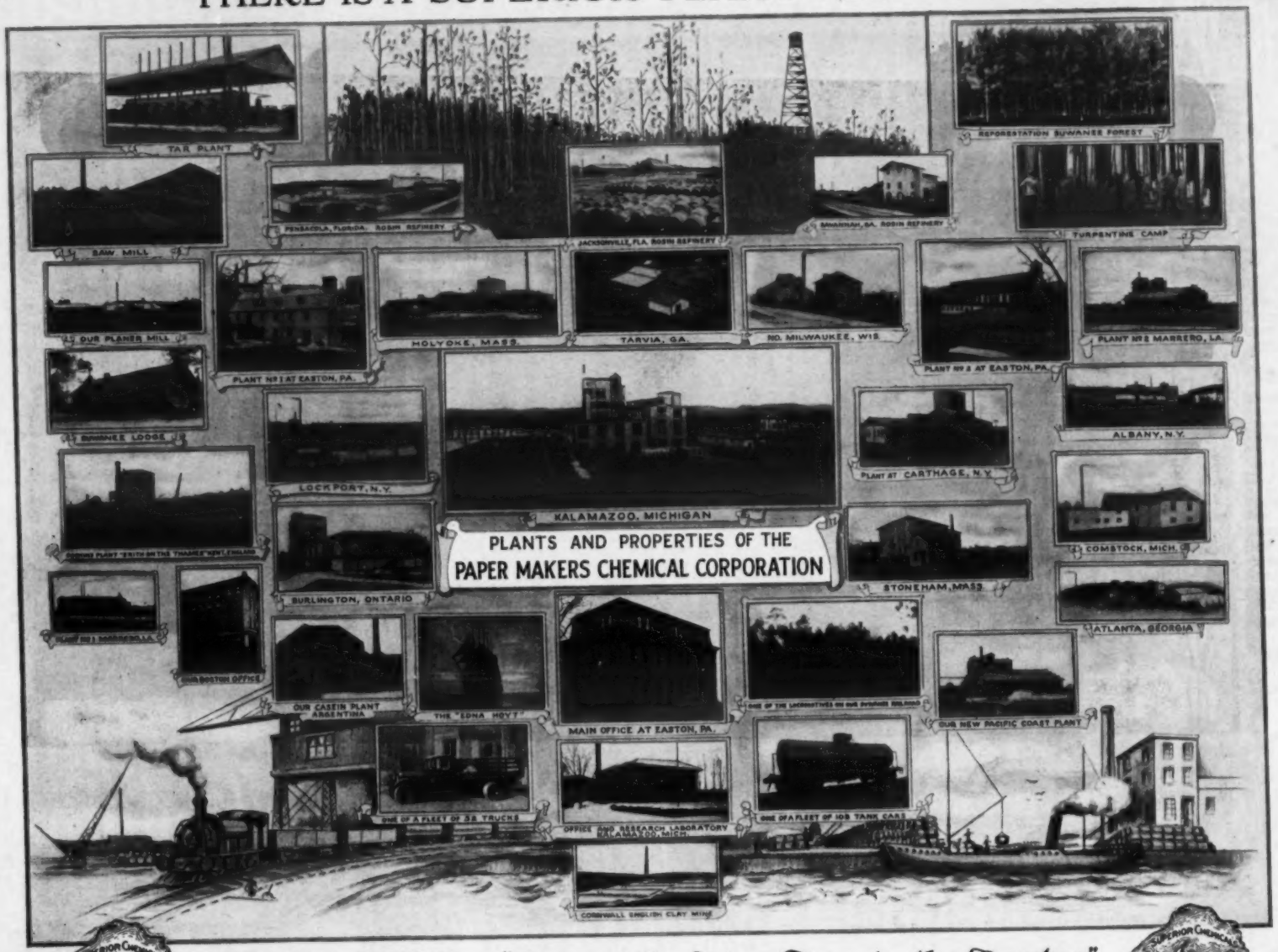

ROSIN SIZE – *"From the Pine Tree to the Beater."*

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SUPERIOR CHEMICALS TRADE MARK

Papermaking Rags

A generally improved demand from paper mills, coupled with a more stringent supply condition brought about by inclement weather curtailing collections in many parts of the country, has created a distinctly firmer price situation in papermaking rags, and some grades have scored a further fair increase in value. The condition is somewhat seasonal, and no one seems to believe that there is likely to be any additional movement upward in the market; in fact, the feeling among buyers now is that with the spring approaching, and with it potential larger available supplies of rags, that market prices may react to the levels prevailing prior to the strengthening of values over the past month or two. Moreover, it is asserted that there is a plentiful supply of papermaking rags to be had in Europe, provided American buyers will pay a little more than they now appear prone to bid for shipments from abroad, though it must be admitted that importations recently have fallen off, probably due to consumers in this country being enabled to get domestic rags at proportionately cheaper costs and therefore having neglected foreign stock.

New cuttings of nearly all grades display pronounced price firmness at the higher levels established in sales recently. Fine paper mills have bought such rags in better volume than in a lengthy period, and their activity in the market, together with a rather restricted production of most cuttings by clothing houses, has carried prices into considerably higher ground in some cases. New blue overall cuttings are now quoted by dealers in the East at 7.50 cents and more per pound f.o.b. New York, while new light silesias have moved up in price to 8 cents a pound New York, and fancy shirt cuttings to 6 to 6.25 cents. New unbleached cuttings are reported selling at 11 cents a pound at dealers' shipping points, No. 1 washables at 4.75 to 5 cents, and bleached canton flannels at 9.75 to 10 cents. New No. 1 white shirt cuttings are quoted on a wide range by dealers, depending on their location and the quality of cuttings concerned, with purchases said to be possible down to 10 cents a pound f.o.b. shipping points though with 11 cents and higher asked in other quarters.

Domestic roofing rags have been sought freely by mills, and prices have stiffened a trifle to where sales of No. 1 packing or cloth strippings have been recorded at 1.75 cents a pound f.o.b. New York, and of No. 2 stock or mixed satinets at 1.35 cents New York. Perhaps these prices have been exceeded in exceptional cases, as roofing paper mills are concentrating their buying of rags on domestic material while neglecting foreign stock, and thus have created quite a run of demand on the former. Dealers have been cautious in booking orders owing to the limited supplies coming into the market from collection sources though the country—a normal condition in mid-winter. Foreign dark colored cottons have sold in scattered cases at 1.55 cents per pound ex dock New York, while felt paper mills have absorbed some supplies of foreign linsey garments at 1.80 cents on the dock.

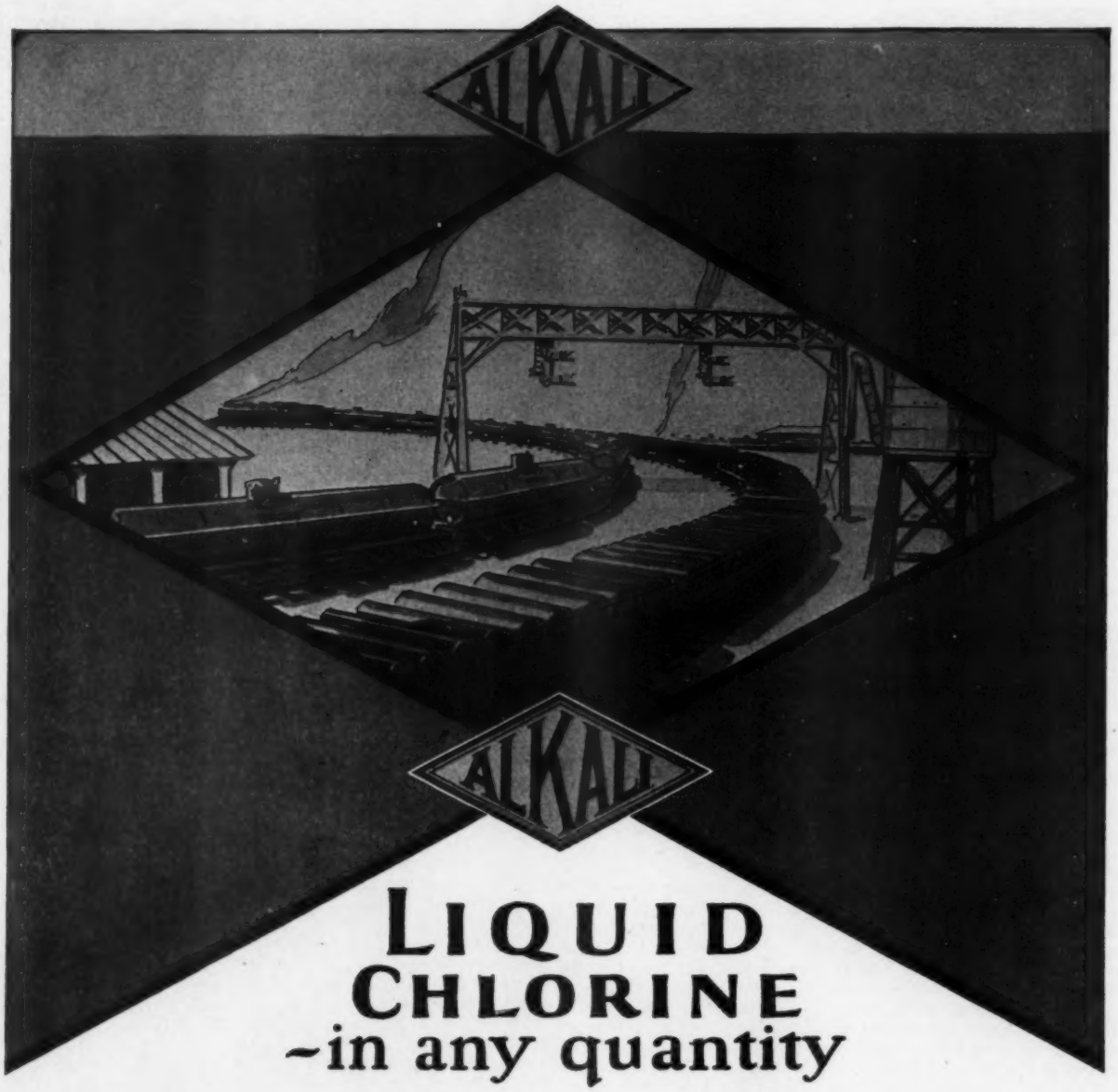
Old white cottons are about on last-quoted price levels but values display a hardening tendency, and it is noted that dealers as a rule ask the upper edge of quotational ranges and mostly hold firm for the figures named. No. 1 repacked whites are quoted at around 6 cents a pound f.o.b. shipping points, according to packing, and No. 2 repacked whites at 2.50 to 3 cents. Repacked thirds and blues continue to bring 2.25 to 2.50 cents a pound at dealers' points, and rough packing of blues 1.70 to 1.90 cents, depending on quality. Not a great deal of activity has been noted in foreign rags, not because paper manufacturers have not displayed buying interest but because in a majority of instances the prices asked are beyond a parity with domestic stock, reflecting a comparatively high market abroad. It is stated, in fact, that paper mills and other consumers in Europe are granting relatively much better prices for rags than are buyers in the United States, and importers consequently are at a disadvantage in importing supplies and selling to paper mill customers at a profit.

Average quotations f.o.b. shipping points and ex dock New York are as follows:

New Stock	New York and Chicago
White shirt cuttings, No. 1	10.00-11.00
White shirt cuttings, No. 2	6.50- 7.50
Fancy shirt cuttings	6.00- 6.25
Washables, No. 1	4.75- 5.00
Unbleached Muslin	11.00-11.50
White lawns	9.00- 9.50
Overall cuttings, blue	7.50- 7.75
Black silesias	4.75- 5.00
Light flannelettes	8.50- 8.75
Canton flannels, bleached	9.75-10.00
Canton flannels, unbleached	8.75- 9.00
Shoe cuttings, bleached	7.50- 8.00
Shoe cuttings, unbleached	6.00- 6.50
Light silesias	8.00- 8.25
O. D. khaki cuttings	5.50- 5.75
Mixed khaki cuttings	4.75- 5.00
Corduroy cuttings	3.25- 3.50
Cottonade cuttings	3.25- 3.50
Linens, No. 1, white foreign	14.00-15.00
Light prints foreign	3.00- 3.25
Old Stock—	
Whites, No. 1, repacked	5.50- 6.50
Whites, No. 2, repacked	2.50- 3.00
Whites, house soiled	2.00- 2.25
Whites, street soiled	1.85- 2.00
Lace curtains	5.50- 5.75
Thirds and blues, rough	1.70- 1.90
Thirds and blues, repacked	2.25- 2.50
Black stockings	4.10- 4.25
Cotton canvas, No. 1	4.75- 5.00
White cotton batting	4.50- 4.75
Roofing, No. 1 (cloth strippings)	1.70- 1.75
Roofing, No. 2	1.35- 1.40
Linsey garments, foreign	1.75- 1.80
Dark colored cottons, foreign	1 55- 1.60
Blue linens, foreign	3.75- 4.00
Gray linens, foreign	4.00- 4.50
White linens, foreign	7.50- 8.00
Light prints, extra foreign	1.80- 2.00

Rope and Bagging

There appears every basis for the assertion that paper mills are using larger quantities of old rope; apparently in some cases manufacturers who were substituting kraft wood pulp for old rope have returned to the latter raw material, while in other instances it is said that mills have experienced a better market for rope papers and consequently have been in need of bigger supplies of old rope. The market is firm; prices, if anything, exhibit a rising tendency, and dealers and importers assert that they are finding a ready outlet among mills for about all of the old manila rope of strictly prime grade they can find available. Domestic No. 1 old manila rope is bringing 4 cents a pound f.o.b. dealers' shipping points, and perhaps higher than this figure has been granted by paper mills in some cases, while No. 1 foreign old manila rope is selling at 3.60 to 3.75 cents a pound ex dock New York and other American Atlantic ports. On the other hand, old strings are in nothing more than routine demand, and prices are simply holding their own at



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about 90 cents per hundred pounds f.o.b. shipping points for the usual run of mixed strings, and 1.50 to 1.75 cents a pound for sisal strings.

Bagging is in limited call from paper mills, and prices are in favor of buyers. Scrap burlap of No. 1 quality is available at 1.60 cents a pound at dealers' points, and prices of roofing bagging are in the vicinity of 1.20 cents a pound f.o.b. and ex dock New York. Scrap wool tares are selling around 1.60 cents a pound, depending on the quality of the material.

F.o.b. shipping point and ex dock New York quotations follow:

	New York and Chicago
Gunny, No. 1 domestic	1.60-1.70
Gunny, No. 1 foreign	1.50-1.60
Scrap bagging, No. 1	1.55-1.65
Roofing bagging	1.15-1.25
Wool tares, heavy	1.65-1.75
Wool tares, light	1.55-1.65
Manila rope, No. 1 foreign	3.50-3.75
Manila rope, No. 1 domestic	4.00-4.25
Sisal strings	1.50-1.75
Mixed strings	.90-1.10

Old Paper

Paper and board mills are buying old paper actively and are paying firm prices. The brisk consuming demand, coupled with a rather drastic reduction in collections in many of the big cities of the country, especially in the Middle West, and caused by bad weather conditions, are factors making for a distinctly strong price tone, and dealers are not hesitating to mark up quotations, and report that mills are meeting the higher rates. The low grades are chiefly affected by the curtailment of collections, and therefore display a relatively firmer price condition than the higher qualities. Folded news is reported selling in the Middle West at a cent per pound f.o.b. shipping points, and doubtless a bit above this price has figured in some transactions, while the prevailing market basis in New York on this grade is 70 cents per hundred pounds f.o.b. that city. Old No. 1 mixed paper is quoted from a low of about 60 cents a hundred pounds f.o.b. shipping points in the East to up around 85 or 90 cents in the West.

Shavings are quoted at 2.65 to 3.10 cents a pound at dealers' shipping points, according to grade, for No. 1 hard white shavings, and on a range of 2.25 to 2.60 cents for soft white shavings. Mills in certain instances are reported paying a premium for extra quality hard shavings containing a good percentage of rag fibre, sales of such stock having been rumored at 3.25 cents or close to that figure f.o.b. shipping points. Heavy book stock is steady at around 1.50 cents a pound, while crumpled book stock is quoted at an average price of 1.25 cents per pound at dealers' points.

The following are quotations named by dealers f.o.b. shipping points:

	New York and Chicago
Hard white shavings, No. 1	2.65-3.10
Hard white shavings, No. 2	2.50-2.75
Soft white shavings	2.25-2.60
Colored shavings	1.00-1.25
Heavy book, No. 1	1.45-1.55
Crumpled book, No. 1	1.20-1.30
Ledger stock	1.50-1.75
Kraft, No. 1	1.80-1.90
New kraft cuttings	2.40-2.60
Manilas, No. 1	.80-1.00
Folded news	.70-1.00
Sulphite mill wrappings	.75- .85
Old corrugated boxes	.65- .75
New corrugated box cuttings	.80- .90
Mixed paper, No. 1	.60- .90
Common paper	.45- .55

Pulpwood

The market for pulpwood is reported showing fair activity, with consumers absorbing supplies freely and displaying considerable buying interest. The price tone is steady to firm,

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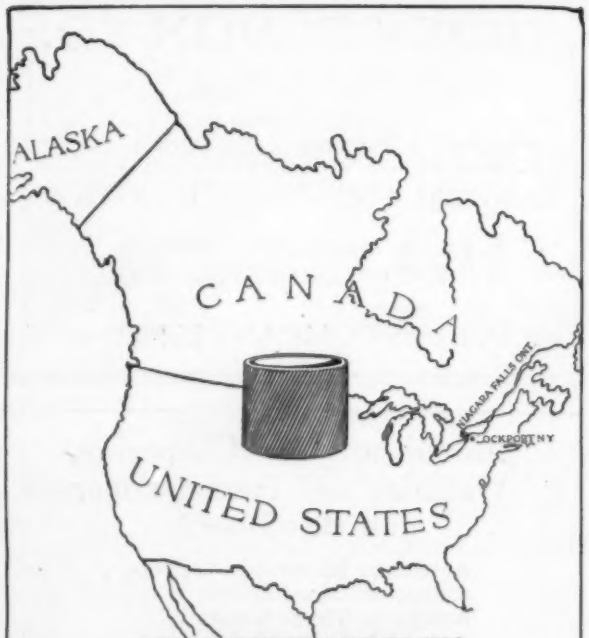

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though no advancement of a definite character has been recorded.

Exports of pulpwood from Canada, all of which came to the United States, in January, 1929, amounted to 70,536 cords, valued at $649,837, showing an appreciable decline from the 113,527 cords of a value of $1,057,959 exported in the same month of last year.

Mechanical Pulp

Production of mechanical pulp in the United States in 1928 reached a total of 1,047,888 net tons, recording a little increase over the 1,030,966 tons produced in the preceding year, but a decline as compared with 1,168,845 tons produced in 1926, and also a loss contrasted with 1,092,687 tons manufactured by domestic mills in 1925, according to statistics compiled by the American Paper and Pulp Association. Imports of mechanical pulp into the United States during the last calendar year, according to U. S. Department of Commerce figures, totaled 222,499 long tons, valued at $5,443,495, compared with 219,285 tons of a value of $5,961,821 in 1927, and 271,213 tons of a value of $8,278,220 imported in 1926.

The market for ground wood is developing additional firmness. Cold temperatures in many grinding regions has cut down production substantially recently, and producers therefore are in a more independent position and are enabled to hold for the prices quoted. Canadian grinders in frequent instances, it is reported, are refusing to accept orders for freshly ground pulp under $26 a ton f.o.b. pulp mills in the Dominion, while $24 is said to be near the bottom price level at which purchases can be effected currently across the border. Domestic ground wood is quoted at around $27 a ton at grinding plants, and imported ground wood of Scandinavian origin is firm quotably at $32 to $33 per short ton ex dock New York or other American Atlantic ports for dry pulp.

Chemical Pulp

The United States produced a total of 1,449,960 net tons of chemical wood pulp in 1928, according to mills reporting to the American Paper and Pulp Association, which doubtless constituted a new high record of output in this country in any year, comparing with 1.292,315 tons produced in 1927, 1,291,533 tons in 1926, and 1,199,992 tons in 1925. Domestic production last year included 297,870 tons of bleached sulphite, against 284,490 tons in 1927; 452,340 tons of news grade sulphite, against 479,964 tons in 1927; 40,497 tons of easy bleaching sulphite, against 48,042 tons; 80,979 tons of Mitscherlich sulphite, against 80,791 tons; 296,285 tons of sulphate pulp, against 198,717 tons, and 282,815 tons of soda pulp, against 198,777 tons.

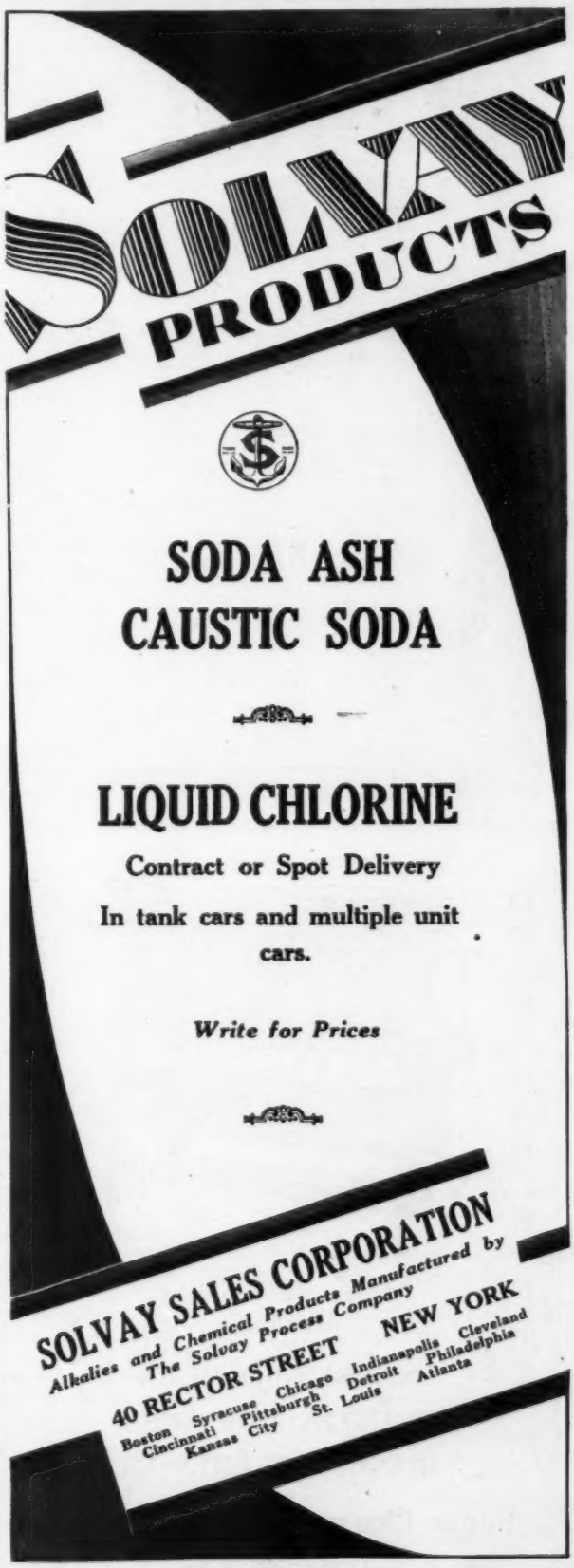
A steady undertone prevails in the market for domestic chemical pulps. There has not been a great deal of open-market demand lately, but the movement of supplies against contracts has been of good tonnage, and easily sufficient to have sustaining influence on ruling values. Bleached sulphite of the more popular grades is selling at 4 cents or thereabouts per pound f.o.b. pulp mills, with some qualities quoted at 4.25 cents and up to 4.75 cents. News grade sulphite is firm at around 2.60 cents a pound at producing points, while book sulphite is quoted between 2.75 and 3 cents per pound. No. 1 kraft pulp is holding its own quotably at 2.75 cents to slightly higher at pulp mills, and bleached soda pulp is quoted on a basis of around 3.50 cents a pound delivered paper mills.

Quotations f.o.b. pulp mills are as follows:

Bleached sulphite	3.75-4.75
Easy bleaching sulphite	2.75-3.00
Unbleached sulphite, No. 1 strong (new grade)	2.50-2.75
Unbleached sulphite, No. 1 book	2.75-3.00
Soda pulp, bleached (delivered)	3.40-3.60
Mitscherlich, unbleached	3.00-3.25
Kraft, No. 1	2.75-3.00
Screenings, refined	1.40-1.60

Chemicals

Quoted rates on papermaking chemicals are steady to firm, with little or no change reported in prices of any item. A



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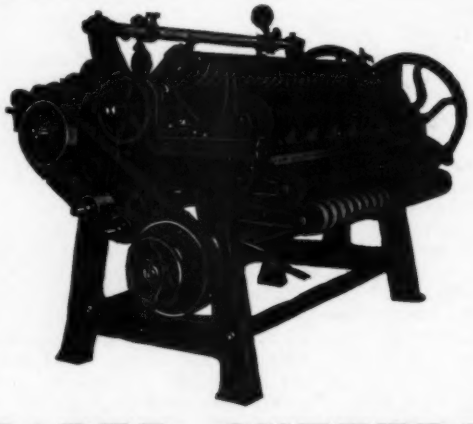

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White sulphite	9–30
Colored rag	15–40
Colored sulphite	8–30
Ledger—	
White rag	16–40
White sulphite	9–30
Colored sulphite	8–30
Colored rag	15–40
Bonds—	
White rag	16–40
White sulphite	7–30
Colored sulphite	7–30
Colored rag	15–40
Books—	
No. 1 S. & S. C.	5.75– 8.00
Machine finished	5.50– 8.00
English finish	5.50– 8.00
Coated and enameled	7.50–13.00
Lithograph, M. F.	7.50–14.00
Newsprint—	
Rolls, contract	2.75–
Rolls, transient	3.00– 3.25
Sheets	3.25– 3.50
Side runs	2.75– 3.00
Cover stock—	
Coated, both sides	–10.25
Coated, one side	–10.15
Tissue—	
No. 1 white, 20x30	.75– .90
No. 2 white, 24x36	.75– .90
No. 1 Manila, 24x36	.70– .80
Kraft	.90– 1.00
Wrapping—	
No. 1 kraft	5.50– 6.00
No. 2 kraft	4.25– 4.75
Southern kraft	4.25– 4.50
Boards—	New York and Chicago
Solid news	35.00–40.00
Straw	52.50–57.50
Plain chip	30.00–35.00
White coated chip	45.00–50.00
Manila coated chip	40.00–45.00
Binder's board	65.00–70.00

Chemicals

(*Continued from page* 2305)

good movement of supplies is in progress, though principally against contracts. Average quotations are as follows:

Alum, lump ammonia	3.50 - 3.75
Alum, lump starch	3.75 - 4.00
Blanc fixe, powder	3.50 - 3.75
Bleaching powder	2.00 - 2.35
Brimstone (long ton, at mine)	18.00 -20.00
Casein (duty paid)	15.50 -16.50
Caustic soda, spot delivery	2.90 - 3.00
China clay, domestic washed	8.00 -10.00
China clay, foreign	15.00 -20.00
Rosin, Grade E	9.10 - ....
Satin white	2.00 - 2.25
Soda ash, 50 per cent light (bags)	1.32½- ....
Starch, papermakers', in bags	3.82 - ....
Talc (ton)	16.00 -18.00

Another Proposed Cornstalk Pulp Mill

According to reports from Taylorville, Illinois, the first cornstalk bond paper to be manufactured in the State was made at the plant of the Hopper Paper Company, Taylorville, from a combination of cornstalk pulp and wood pulp.

This interesting experiment is said to be the forerunner to the establishment of a proposed two million dollar pulp and paper mill in this heart of the cornbelt. The addition of the pulp mill to the present Taylorville paper plant depends principally upon the co-operation of the farmers in the supplying of cornstalks, and the indication is that the farmers will support the project.

The twenty-five tons of wet lap cornstalk pulp used in the above experiment was brought from the Cornstalk Products company's plant at Danville, Ill., and it is intended that the proposed pulp mill will use the process worked out at Danville by having the pulp and paper mill located together, which according to statements given out will save $10 per ton in production costs.

Verdict Against Hammermill Reversed

A verdict of $12,434 against the Hammermill Paper Co. of Erie, Pa., awarded to Horace R. Hayday, assignee for the Hughes Brothers Timber Co., by the St. Louis county court was reversed by the Minnesota Supreme Court at St. Paul, Minn., Feb. 1.

The suit was originally brought on by Hayday when the Hammermill company contracted for 20,000 cords of pulpwood, which was to be cut and delivered by the Hughes Brothers Timber Co. to the Hammermill plant. After 30 carloads of wood cut during the winter of 1923 and 1924 from the Pigeon Bay and Grand Marais country had been delivered and accepted by the buyers, the Hammermill Paper Co. notified the Hughes company that the balsam percentage of the wood was too high, and refused to accept more timber. Hayday sued for failure to fulfill contract.

Hayday asked damages of $22,707 in the St. Louis county court and received the verdict of $12,434, which is now set aside.

Forest Products to Give Sulphite Course

The short course of instruction in the sulphite pulping of wood, which was presented twice at the Forest Products Laboratory in the spring of 1927, will be given again March 25 to April 6 next, according to an announcement from C. P. Winslow, Director of the laboratory. As in previous courses, the enrollment will be limited to fifteen men. Vance P. Edwardes, who was in charge of the 1927 courses, will again direct the lectures and demonstrations. A special feature of the coming course will be demonstrations of the pulping of eastern hemlock by the sulphite process, and of hardwoods by both the sulphite and semi-sulphite processes.

The sulphite courses are based on the results of research on which thousands of dollars of federal funds have been expended. During the progress of the courses, the entire physical equipment and personnel of the pulp and paper section of the laboratory is at the disposal of the short course men. Owing to the fact that no Forest Service funds are allotted to instructional work a co-operative fee of $200 is required of each man enrolling in the courses. This amount represents only the co-operator's share of immediate costs incurred during the progress of the courses and the preparation of the lectures and demonstrations.

Applications for enrollment in the March 25 course should be addressed to the Director, Forest Products Laboratory, Madison, Wis.

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EXPORTS

Exports of paper and paper board from the United States during the calendar year of 1928 recorded an appreciable increase in point of value over the exportations in the preceding year, according to statistics compiled by the U. S. Department of Commerce. Total exports of paper of all kinds from this country last year were valued at $30,932,651, compared with shipments of a value of $26,945,746 in 1927. The December, 1928, exports amounted in value to $2,697,188, against $2,231,440 in the similar month of 1927.

Exportations of newsprint paper from the United States last year were 22,780,530 pounds of a value of $866,046, compared with 24,657,313 pounds of a value of $1,191,033 in 1927. Exports of book paper, not coated, during the last calendar year totaled 24,509,919 pounds of a value of $1,789,604, contrasted with 16,044,863 pounds of a value of $1,370,932 in 1927. Wrapping paper exports last year amounted to 36,757,253 pounds of a value of $2,586,848, against 32,312,413 pounds of a value of $2,256,059 exported in 1927, while writing paper shipments were 25,833,846 pounds of a value of $2,832,934 in 1928, showing an appreciable gain over the 13,228,375 pounds of a value of $1,918,051 exported in the preceding year.

Tissue and crepe paper exports last year reached a total of 4,995,465 pounds, valued at $1,096,324, against 4,801,391 pounds of a value of $1,091,531 in 1927, and there was a sharp increase in surface-covered paper exports from 5,973,265 pounds of a value of $768,132 in 1927, to 11,156,835 pounds of a value of $1,137,134 in 1928. Exports of cover paper in 1928 were 2,037,523 pounds, valued at $340,972, against 1,651,343 pounds of a value of $283,083 in 1927; of greaseproof and waterproof paper 3,107,467 pounds of a value of $489,647, against 2,613,479 pounds of a value of $380,647; of blotting paper 3,920,957 pounds of a value of $445,510, against 3,666,789 pounds of a value of $411,410; of toilet paper 6,447,953 pounds of a value of $685,478, against 5,527,862 pounds of a value of $668,871; of paper bags 9,155,249 pounds of a value of $801,027, against 11,246,849 pounds of a value of $971,420, and of paper boxes and cartons 28,434,923 pounds of a value of $1,899,446, against 23,659,020 pounds of a value of $1,637,954.

The United States exported 48,669,581 pounds of box board, valued at $1,353,561, in 1928, showing an increase over the 43,633,581 pounds of a value of $1,351,016 in 1927, while exports of other paper board and strawboard last year were 42,124,168 pounds of a value of $2,149,565, also recording a gain over the 38,554,831 pounds of a value of $2,072,702 exported in 1927.

IMPORTS

Wood Pulp

According to statistics just released by the U. S. Department of Commerce, imports of chemical wood pulp into the United States during the calendar year 1928 reached a new high level for any previous year, totaling 1,351,005 long tons of a value of $78,476,280, as compared with 1,280,285 tons of a value of $80,124,449 in 1927, 1,278,548 tons of a value of $83,208,851 in 1926, and 1,191,875 tons of a value of $73,469,063 in 1925. Imports of mechanical pulp last year showed a slight gain over the preceding year's tonnage, but fell well below the importations in some other previous years. A total of 222,499 long tons of ground wood was imported in 1928, valued at $5,443,495, against 219,285 tons of a value of $5,961,821 in 1927, 271,213 tons of a value of $8 278,220 in 1926, and 295,618 tons of a value of $8,517,116 in 1925.

The above figures show that while the tonnage of imports last year was above that of 1927, the value of pulp imports was less—both in the case of chemical pulp and in ground wood. This probably reflected a lower market in 1928 than in the preceding year. Imports of bleached sulphite last year amounted to 307,771 long tons of a value of $23,268,424, against 311,130 tons of a value of $24,224,626 in 1927, while imports of unbleached sulphite were 640,660 tons of a value of $32,587,134 in 1928, registering an appreciable gain over the 613,856 tons of a value of $34,262,845 imported in 1927. Imports of sulphate or kraft pulp last year were 381,256 tons, valued at $21,170,948, compared with 341,162 tons of a value of $20,684,298 in 1927.

Thus, the average value of the bleached sulphite imported into the United States last year was $75.60 per long ton, against $77.86 a ton in 1927; while the average value of the unbleached sulphite imported was $50.86, against $55.81 in 1927, and the average value of kraft pulp was $55.53 a ton, contrasted with $60.63 in 1927.

Papermakers have held rather aloof from the pulp market recently. There has been buying activity, of course, but it has been principally of routine sort, and consumers have purchased in a reserved manner. Evidently most paper mills have their needs supplied for a time and are not obliged to engage in additional buying just yet and are waiting until the spring draws nearer and with it the first open water shipment season abroad before seeking to cover further requirements. Nevertheless a decidedly firm undertone marks prices of pulp, particularly sulphite. It appears as if producers in Scandinavia and elsewhere in Europe are well sold up for this year, and that they have become a bit bullish in viewing the outlook and are not hesitating to ask slightly higher rates for pulp. Instances have been cited frequently where buyers here have sought to sound out the primary markets by making bids at a trifle under recognized market price levels, and in almost every case refusals have been received from abroad.

Strong unbleached sulphite is quoted at 2.60 cents a pound ex dock New York and other American Atlantic ports in most cases, with purchases at 2.55 cents and possibly down to 2.50 cents still to be effected though with some lines of prime sulphite held firmly at 2.65 and 2.70 cents. Prime bleached sulphite is firm at 3.85 to 4 cents per pound ex dock for the more popular brands, with quotations ranging up to 4.25 cents on extra qualities, while prime easy bleaching sulphite is quoted around 2.80 cents on the dock. Prime Swedish kraft pulp is on a price level of 2.50 to 2.60 cents ex dock New York, and prime Scandinavian ground wood is quoted at $32 to $33 per short ton ex dock for dry pulp.

Current market quotations ex dock New York, and receipts at the port of New York during February, 1929, follow:

Bleached sulphite, No. 1	3.85– 4.25
Unbleached sulphite, strong No. 1	2.55– 2.75
Unbleached sulphite, No. 2	2.35– 2.55
Easy bleaching sulphite	2.75– 3.00
Mitscherlich unbleached, genuine	2.00– 3.25
Mitscherlich unbleached, ordinary	2.60– 2.75
Kraft, standard Swedish	2.50– 2.60
Ground wood, per ton (dry)	32.00–33.00

E. J. Keller Co., 400 bls. from Oslo and 651 Bremen; E. M. Sergeant Co., 849 bls. from Gothenburg; Perkins-Goodwin Co., 375

The TRADE MARK of STANDARD PURITY

IS YOUR ASSURANCE OF HIGH QUALITY

It eliminates the chances of costly errors which might result from variation in the purity of the chemicals you use. It helps you to standardize your processes, and to maintain the uniformity you seek in the products you make. It is a mark of "plus value."

SULPHURIC ACID

Aluminum Sulphate
Glauber's Salt
Disodium Phosphate
Trisodium Phosphate
Muriatic Acid
Acetic Acid
Sodium Sulphide
(Chip Patented)
Anhydrous Bisulphite Soda
And other Heavy Chemicals of Standard Quality
Insecticides and Fungicides

Also

Baker & Adamson Quality C. P. Acids and Reagents which may be purchased from the General Chemical Company or local dealers.

GENERAL CHEMICAL COMPANY

40 RECTOR ST., NEW YORK

CABLE ADDRESS, LYCURGUS, N.Y.

BUFFALO
CHICAGO
CLEVELAND
PITTSBURGH
PROVIDENCE
DENVER
ST. LOUIS
THE NICHOLS CHEMICAL CO., LTD., MONTREAL
LOS ANGELES
PHILADELPHIA
SAN FRANCISCO

263

bls. from Drammen; Atterbury & McKelvey, 540 bls. from Tofte; O. E. Klaer, 750 bls. from Greaker; J. Andersen & Co., 2,160 bls. from Greaker; Bulkley, Dunton & Co., 4,620 bls. from Hernosand, 11,875 Stugsund, 3,964 Gothenburg and 6,675 Gefle; Woodpulp Service Corp., 125 bls. from Gothenburg; Price & Pierce, 2,750 bls. from Gothenburg; Atterbury Bros., 4 bls. from Helsingfors, 200 Gothenburg and 500 Oslo; M. Gottesman & Co., 1,345 bls. from Rotterdam; Pagel, Horton & Co., 1,250 bls. from Stockholm; Castle & Overton, 876 bls. from Rotterdam and 1,813 Hamburg; Hudson Trading Co., 1,421 long tons and 14 cwt ground wood from Liverpool, N. S.; Irving Trust Co., 508 bls. from Hamburg; Scandinavian Pulp Agency, 375 bls. from Gefle; Central National Bank, 250 bls. from Gefle; Order, 329 bls. from Gothenburg, 677 Helsingfors, 15,171 Kotka and 260 Hamburg.

Paper Stock

There was an appreciable increase in importations of papermaking rags into the United States during the last calendar year as compared with 1927. A total of 439,892,896 pounds, valued at $8,195,224, was imported last year, against 388,121,400 pounds of a value of $7,646,864 imported in 1927, according to official U. S. Department of Commerce statistics. Imports of waste bagging and waste paper in 1928 totaled 148,756,214 pounds of a value of $1,957,937, contrasted with 108,793,425 pounds of a value of $1,429,424 in 1927, while imports of old rope and miscellaneous paper stock also gained last year, amounting to 70,723,965 pounds of a value of $2,065,267, compared with 64,977,715 pounds of a value of $1,985,313 imported in 1927.

Imports of papermaking materials in February were rather light, judging from arrivals through the port of New York last month. Receipts of all grades of paper stock excepting wood pulp at that port during February, these data being taken from manifests of steamers reaching New York during the month, were as follows:

Old Rope—William Steck & Co., 93 coils; Ellerman's Wilson Line, 168 coils; United Fruit Co., 8 bls.; Brown Bros. & Co., 1,640 coils and 426 bls.; W. Schall & Co., 136 bls.; S. Birkenstein & Sons, 27 coils; N. E. Berzen, 1,990 rolls; R. M. Gray, Inc., 38 coils; International Purchasing Co., 179 coils; Jaffre Products Co., 35 bls.; Panama-Pacific Line, 30 coils; E. J. Keller Co., 55 bls.; Order, 75 rolls, 181 coils and 72 bls.

Old Bagging—Darmstadt, Scott & Courtney, 228 bls.; Interstate Trust Co., 61 bls.; International Purchasing Co., 184 bls.; Marquardt-Hewitt Corp., 49 bls.; Van Oppen & Co., 17 bls.; Overton & Co., 51 bls.; Whaling Waste Products Co., 126 bls.; Bank of the Manhattan Co., 106 bls.; Johns-Manville Corp., 68 bls.; Castle & Overton, 54 bls.; E. J. Keller Co., 151 bls.; Union Bank & Trust Co., 226 bls.; Banca Commerciale Italiana Trust Co., 162 bls.; Irving Trust Co., 19 bls.; A. W. Fenton, Inc., 51 bls.; Order, 58 bls.

Rags—E. J. Keller Co., 1,078 bls.; Castle & Overton, 237 bls.; Darmstadt, Scott & Courtney, 149 bls.; Victor Galaup, Inc., 74 bls.; Jebb Bros., 37 bls.; H. Burrows, 6 bls.; E. Butterworth & Co., 93 bls.; J. Cohen & Sons Co., 249 bls.; Daniel M. Hicks, Inc., 35 bls.; S. Birkenstein & Sons, 263 bls.; Katzenstein & Keene, 357 bls.; William Steck & Co., 54 bls.; Salomon Bros. & Co., 40 bls.; Ernst Mayer, 49 bls.; Federated Metals Corp., 25 bls.; Alexander H. Searle, Inc., 9 bls.; Jaffe Products Co., 38 bls.; P. Garvan, Inc., 72 bls.; American Wool Stock Co., 22 bls; Guaranty Trust Co., 204 bls.; Chase National Bank, 1,811 bls.; Intestate Trust Co., 65 bls.; Chemical National Bank, 25 bls.; Standard Bank of South Africa, 85 bls.; Equitable Trust Co., 102 bls.; Irving Trust Co., 124 bls.; Atlantic National Bank, 10 bls.; Manufacturers Trust Co., 619 bls.; Fidelity Trust Co., 334 bls.; Bank of America, 5 bls.; National City Bank; 44 bls.; Bankers Trust Co., 39 bls.; Union Bank & Trust Co., 145 bls.; Bank of the Manhattan Co., 132 bls.; J. A. Manning Paper Co., 10 bls.; C. R. Spence & Co., 341 bls.; A. W. Fenton, Inc., 737 bls.; Brown Bros. & Co., 154 bls.; J. A. Medina, 95 bls.; Overton & Co., 7 bls.; Amtorg Trading Co., 1,173 bls.; American Express Co., 16 bls.; Van Oppen & Co., 46 bls.; Order, 1,437 bls.

Miscellaneous Paper Stock—Castle & Overton, 618 bls.; H. B. Frank, 63 bls.; J. Cohen & Sons Co., 24 bls.; S. Schapiro & Sons, 12 bls.; Ernst Mayer, 104 bls.; E. Butterworth & Co., 103 bls.; Daniel M. Hicks, Inc., 110 bls.; E. J. Keller Co., 114 bls.; Chase National Bank, 159 bls.; State Street Trust Co. of Boston, 222 bls.; State Bank & Trust Co., 34 bls.; Bank of the Manhattan Co., 102 bls.; National City Bank, 14 bls.; Amtorg Trading Co., 28 bls.; Furness, Withy & Co., 152 bls.; Milton Snedeker Corp., 107 bls.; A. W. Fenton, Inc., 53 bls.; T. D. Downing & Co., 106 bls.; Van Oppen & Co., 35 bls.; Atlantic Forwarding Co., 7 bls.; G. W. Sheldon & Co., 84 bls.; Amsinck, Sonne & Co., 70 bls.; Order, 551 bls.

Paper

Imports of paper into the United States during 1928, reaching a total value of $156,384,548, scored a fair increase over the importations in 1927 amounting in value to $149,365,343, according to U. S. Department of Commerce official statistics. The bulk of these imports was, of course, newsprint paper, imports of which grade totaled 4,313,732,865 pounds, valued at $139,410,918, last year, against 3,974,129,203 pounds of a value of $131,488,784 imported in 1927.

Imports of paper in February, 1929, were of about normal volume, judging from receipts through the port of New York. Arrivals of all kinds of paper at that port last month, these data being taken from manifests of steamers reaching New York during the month, were as follows:

MITTS & MERRILL

Conveyor or Gravity Feed Shredder

Give Beaters a Lift

The MITTS & MERRILL SHREDDER through it's economical method of preparing stock for the beater contributes much to the completion of the beater's work in the shortest possible time, thereby cutting down operating costs and speeding up the process of paper making.

MITTS & MERRILL SHREDDERS are built in sizes with spouts ranging from 18″ to 45″ wide. We will be glad to quote you on any size adapted to your requirements.

It gives the beater an economical lift.

MITTS & MERRILL

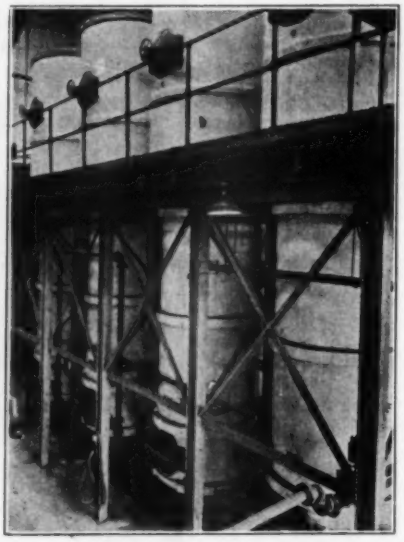
1013 Tilden Street Saginaw, Mich.

We also build a 100% efficient "Hog" to reduce pulp mill bark and wood refuse.

See pages 364 and 365 in the 1928 Paper and Pulp Mill Catalogue

IMPROVED BADGER BLACK LIQUOR EVAPORATORS

Recent Installation
CHAMPION
FIBRE CO.
Canton, N. C.



NON-FOAMING

MAXIMUM
STEAM ECONOMY

NO ENTRAINMENT

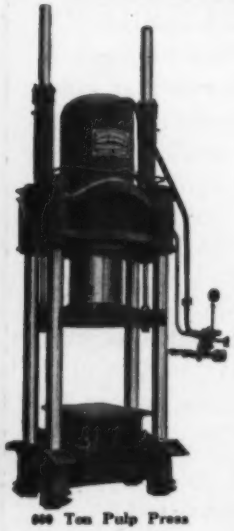
SODA and
SULPHATE
PROCESSES

E. B. BADGER & SONS CO., Boston, U. S. A.

See page 314 in the 1928 Paper and Pulp Mill Catalogue

SOUTHWARK

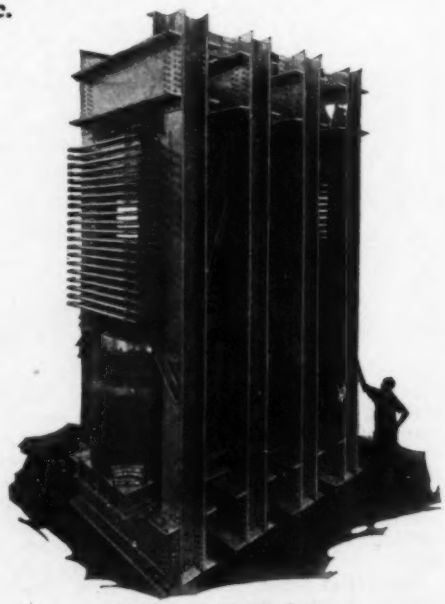
Hydraulic Equipment for Pulp and Paper Mills, Wall Board Plants, Etc.



800 Ton Pulp Press

PULP PRESSES
BALING PRESSES
WALL BOARD PRESSES
PULP TRUCKS
HYDRAULIC PUMPS
ACCUMULATORS
VALVES, FITTINGS, ETC.

Southwark Hydraulic Equipment is the choice of the largest and best known Pulp and Paper Mills throughout the country. They find Southwark products give the most efficient service under exacting conditions. Write for Bulletin No. 14.



2000-ton 12'-6"x4'-6"
20 Opening Wall Board Press

SOUTHWARK FOUNDRY and MACHINE CO.

400 WASHINGTON AVENUE
PHILADELPHIA, PA.

343 S. DEARBORN ST.
CHICAGO

AKRON
100 E. SOUTH ST.

Printing—Neypaco Paper Co., 20 cs. from Havre; Stora Kopparberg Corp., 59 reels from Gothenburg; Hudson Trading Co., 140 reels from Oslo; Keuffel & Esser Co., 251 rolls from Hamburg; E. Dietzgen & Co., 73 cs. from Hamburg, 117 cs. Rotterdam and 25 cs. Havre; Oxford University Press, 25 cs. from Liverpool; Dingelstedt & Co., 13 cs. from Bremen; Hoboken Trust Co., 4 cs. from Bremen; J. J. Bernitz, 253 bls. from Hamburg; P. C. Zuhlke, 175 cs. from Antwerp; The Times Co., 94 reels from Gothenburg; Journal of Commerce, 66 reels from Helsingfors and 65 reels Kotka; Guaranty Trust Co., 258 bls. from Hamburg; National City Bank, 62 bls. from Hamburg; Martin & Bechtold, 11 cs. from Bremen; F. Henjes, Jr., 66 reels from Hamburg and 4 cs. Havre; Order, 794 reels and 16 cs. from Bremen and 1,008 reels Hamburg.

Wrapping—Birn & Wachenheim, 161 cs. from Antwerp; C. K. MacAlpine & Co., 304 bls. from Gothenburg; M. M. Cohen, 222 reels and 24 bls. from Gothenburg; E. Dietzgen & Co., 5 cs. from Rotterdam; F. C. Strype, 2 cs. from Southampton; Manhattan Paper Co., 21 reels from Gothenburg; Arkell Safety Bag Co., 132 reels from Gothenburg; Blauvelt Wiley Paper Mfg. Co., 288 reels from Gothenburg; Crepe Kraft Co., 77 reels from Gothenburg; Steffens, Jones & Co., 21 cs. from Antwerp; J. C. Heffernan Paper Co., 120 bls. from Genoa; J. H. Shroeder Banking Corp., 29 cs. from Hamburg; Order, 15 bls. from Rotterdam.

Cigarette—British-American Tobacco Co., 250 cs. from Southampton; P. J. Schweitzer, Inc., 245 cs. from Marseilles; Heemsoth & Basse, 11 cs. from Bordeaux; American Tobacco Co., 1,535 cs. from Bordeaux; Ligget & Meyers Tobacco Co., 14 cs. from Bordeaux; E. Fougera & Co., 142 cs. from Bordeaux; Equitable Trust Co., 6 cs. from Trieste; Standard Products Corp., 401 cs. from Havre; DeManduit Paper Corp., 887 cs. from St. Nazaire; P. Lorillard & Co., 100 cs. from Marseilles.

Writing—Globe Shipping Co., 2 cs. from Southampton; Guibont Freres & Co., 12 cs. from Southampton and 5 cs. Havre; Coenca-Morrison Co., 11 cs. from Havre; C. A. Redden, 2 cs. from Havre.

Filter—A. Giese & Sons, 15 cs. from Southampton and 4 cs. Hamburg; American Express Co., 2 cs. from London; H. Reeve Angel & Co., 47 cs. from London and 109 cs. Southampton; J. Manheimer, 102 bls. from Southampton; C. Cleicher & Schull Co., 21 cs. from Hamburg.

Drawing—Keuffel & Esser Co., 164 cs. from Hamburg; H. Reeve Angel & Co., 3 cs. from London; Globe Shipping Co., 2 cs. from London.

Tissue—Schenkers, Inc., 152 cs. from Hamburg; G. W. Sheldon & Co., 3 cs. from London; F. B. Vandegrift & Co., 27 cs. from Liverpool; W. J. Byrnes & Co., 6 cs. from Liverpool; Order, 18 cs. from Hamburg.

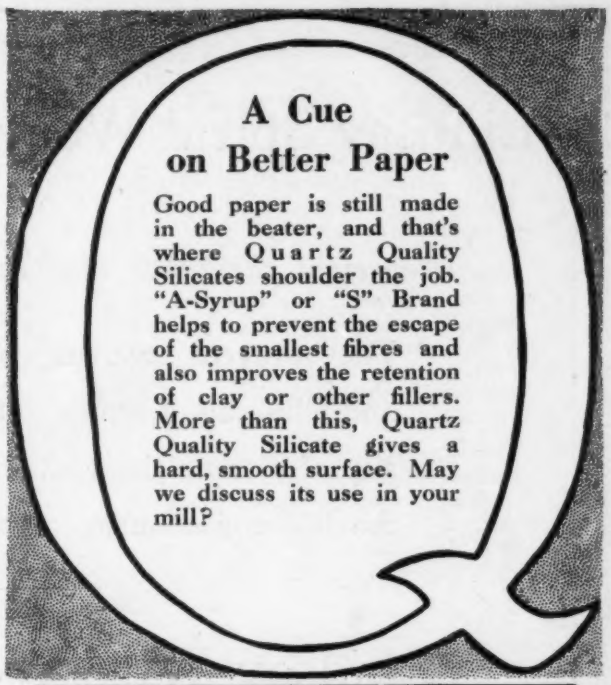
Hanging—F. J. Emmerich & Co., 56 bls. from Liverpool, 18 bls. London and 320 bls. Hamburg; A. C. Dodman, Jr., Inc., 10 pkgs. from Southampton, 3 bls. Havre and 37 cs. Liverpool; W. H. S. Lloyd & Co., 10 bls. from London; Heemsoth & Basse, 3 cs. from Bremen; C. A. Haynes & Co., 98 bls. from London; Globe Shipping Co., 6 bls. from Hamburg; J. E. Bernard & Co., 11 cs. from Rotterdam, 54 bls. Antwerp and 6 bls. Hamburg; F. A. Binder, 70 bls. from Bremen; Universal Carloading & Distributing Co., 3 bls. from Bremen; R. F. Downing & Co., 12 bls. from London; National City Bank, 7 bls. from Hamburg; Irving Trust Co., 60 cs. from Hamburg; Wedemann, Godknecht & Lally, 3 cs. from Hamburg.

Photo—Gevaert Co. of America, 22 cs. from Rotterdam, 120 cs. Bremen and 84 cs. Antwerp; Medo Photo Supply Co., 17 cs. from Southampton; J. J. Gavin & Co., 7 cs. from Liverpool; J. H. Schroeder Banking Corp., 69 cs. from Bremen; P. C. Zuhlke, 72 cs. from Antwerp; Globe Shipping Co., 41 cs. from Rotterdam and 223 cs. Bremen; American Express Co., 54 cs. from Antwerp; Guaranty Trust Co., 2 cs. from Hamburg; Order, 25 cs. from Bremen.

Board—International Forwarding Co., 47 bls. from Hamburg; J. M. Thurman, 32 cs. from Antwerp; American Express Co., 170 cs. from Hamburg; C. K. MacAlpine & Co., 10 bls. from Gothenburg; Chatham & Phenix National Bank, 53 bls. from Gothenburg; Perkins-Goodwin Co., 200 rolls from Rotterdam; Adrian Vuyck, 174 reels from Rotterdam; Coty, Inc., 58 cs. from Havre; Lagerloef Trading Co., 401 bls. from Hamburg; Premier Flong Co., 96 cs. from Bremen; Harriet Hubbard Ayer, Inc., 4 cs. from Havre; Order, 164 bls. from Hamburg.

Miscellaneous—E. Daiber, 17 cs. from Antwerp; Southern Pacific Lines, 3 cs. from Hamburg; Whiting-Patterson Co., 38 cs. from Southampton, 4 cs. Trieste and 4 cs. Bremen; Gallagher & Ascher, 3 cs. from Southampton, 8 cs. Bremen and 7 cs. Hamburg; M. J. Corbett & Co., 3 cs. from Southampton; B. F. Drakenfeld & Co., 54 cs. from Liverpool; G. W. Sheldon & Co., 7 cs. from London; Steiner Paper Corp., 2 cs. from Kobe and 49 cs. Rotterdam; H. Reeve Angel & Co., 4 cs. from Yakohama; Meadows, Wye & Co., 26 cs. from Rotterdam; Steffens, Jones & Co., 2 cs. from Kobe; J. J. Shore & Co., 10 cs. from Bremen; P. H. Petry Co., 9 cs. from Bremen and 11 cs. Hamburg; S. Gilbert, 143 cs. from Bremen; Hensel, Bruckman & Lorbacher, 96 cs. from Bremen and 11 cs. Havre; F. Murray Hill, Inc., 23 cs. from Bremen; Tamm & Co., 18 cs. from Bremen; Globe Shipping Co., 78 cs. from Rotterdam and 2 cs. Havre; Judson Freight Forwarding Co., 2 cs. from Bremen and 2 cs. Rotterdam; J. E. Bernard & Co., 2 cs. from Gothenburg; Keller-Dorian Paper Co., 45 cs. from Havre; Montgolfer & Co., 24 cs. from Havre; Karl Pauli Paper Corp., 7 cs. from Trieste; Standard Products Corp., 6 cs. from Bremen; Universal Carloading & Distributing Co., 21 cs. from Bremen; Bendix Paper Co., 6 cs. from Hamburg; J. Beckhardt & Co., 7 cs. from Rotterdam and 39 cs. Bremen; American Express Co., 38 cs. from Hamburg; Japan Paper Co., 37 cs. from Genoa and 19 cs. Havre; Sinclair & Valentine, 7 cs. from Hamburg; International Forwarding Co., 20 cs. from Hamburg; Acme Letter File Co., 7 cs. from Trieste; Quality Art Novelty Co., 4 cs. from Hamburg; R. F. Downing & Co., 3 cs. from Havre; Hudson Forwarding Co., 3 cs. from Havre; Defiance Sales Co., 6 cs. from Havre.

The American Hoist & Derrick Co., manufacturer of hoisting machinery and crawler type shovel cranes, has opened a branch office at 139 Townsend Street, San Francisco, Calif. A large stock of new equipment and parts will be carried and every facility has been provided to insure prompt service to points in Northern California.


A Cue
on Better Paper
Good paper is still made in the beater, and that's where Quartz Quality Silicates shoulder the job. "A-Syrup" or "S" Brand helps to prevent the escape of the smallest fibres and also improves the retention of clay or other fillers. More than this, Quartz Quality Silicate gives a hard, smooth surface. May we discuss its use in your mill?

PHILADELPHIA QUARTZ CO.
GENERAL OFFICES: PHILADELPHIA
WORKS
Chester, Pa. Utica, Ill. St. Louis, Mo.
Rahway, N.J. Gardenville, N.Y. Anderson, Ind.
Kansas City, Kans.

Starch—

A SIMPLE change in the manufacturing process often results in a pronounced decrease in cost of production.

Paper Mills use Starch for sizing to produce better and stronger sheets with lower cost of manufacture.

Our SPECIAL PAPER brand for beater-sizing increases strength of sheet and gives improved finish.

Our FOX HEAD brand for top-sizing is more economical than all glue-size.

CORN PRODUCTS REFINING COMPANY
17 Battery Place, New York City

Lindsay Spiral Weave Fourdrinier Wires

(Patented Oct. 1927)

Represent the latest idea in paper machine wire cloth.

They prevent grooving of Suction Boxes, scoring and filling up of seams. This overcomes the necessity of planing the suction box covers and adds to the life and tonnage of the wires.

Lindsay Wire Weaving Company

Collinwood Station CLEVELAND, OHIO

BARRE GRANITE IN PRESS ROLLS

Is Revolutionizing the Whole Paper Making Industry

If your Paper Machines are not equipped with Press Rolls of BARRE GRANITE you are not getting the results that you should get, for it is a recognized fact that granite rolls are much superior to any others and Barre Granite the best of all. Let us tell you about them.

Jones Brothers Company

BARRE, VT. BOSTON, MASS.

Foreign Trade Opportunities

The following foreign trade opportunities are issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce. Those interested are requested to communicate with the Bureau at its offices in Washington or New York or its branch offices in other cities, in every case mentioning the number of the inquiries referred to.

No. 36113—Paper bags for flour and coal. Stockholm, Sweden. Agency desired.

No. 36062—Container board, waterproof. London, England. Purchase desired.

No. 36060—Fiber sheets, vulcanized. Calcutta, India. Purchase and agency desired.

No. 36061—Fiber, vulcanized. Hamburg, Germany. Purchase and agency desired.

No. 36064—Newsprint, writing, printing, white calling card, and bristol board paper, and wood pulp cellulose. Sao Paulo, Brazil. Agency desired.

No. 36071—Stationery and flat paper. Wellington, New Zealand. Purchase desired.

No. 35998—Writing paper and paper goods. Pernambuco, Brazil. Agency desired.

No. 36117—Rosin. Montreal, Canada. Agency and purchase desired.

No. 36061—Vulcanized fiber manufacturing machinery. Hamburg, Germany. Purchase desired.

No. 36250—Fish paper for use in electrical industry. Valence, France. Purchase desired.

No. 36217—Wall board. Rotterdam, Netherlands. Purchase and agency desired.

No. 36191—Wood pulp and cellulose. Milan, Italy. Agency desired.

No. 36307—Writing paper, fine. Quebec, Canada. Purchase desired.

No. 36308—Paper yarns for making mats. Sydney, Australia. Purchase desired.

No. 36160—Soda ash, bleaching powder, and sulphate of alumina. Helsingfors, Finland. Agency desired.

No. 36357—Bond paper, fine. Montreal, Canada. Purchase desired.

No. 36358—Sheathing paper and roofing paper. St. Johns, Newfoundland. Agency desired.

No. 36354—Wall board, composition. London, England. Sole agency desired.

No. 36433—Writing papers and envelopes, fancy. Bombay, India. Purchase desired.

No. 36418—Wall paper, medium and better grades. The Hague, Netherlands. Purchase desired.

No. 36355—Cellophane for packing chocolate. Copenhagen, Denmark. Agency desired.

Mazda Lamp Prices Reduced

Mazda lamp prices were again reduced on March 1, 1929, on the 50 and 60 watt lamps of the standard line of inside frosted lamps, President Gerard Swope of the General Electric Company has announced. Price reductions were also made on all colored lamps except flame tints.

This is the twelfth time that Mazda lamp prices have reduced since 1920. Present reduction of approximately ten per cent brings the prices of these lamps to about one-half of their 1914 prices.

"This reduction in price becomes even more impressive when one considers that during the same period the lighting efficiency of Mazda lamps has been greatly increased, the cost of material has gone up and the average wage paid lamp makers has more than doubled", Mr. Swope explained.

The March 1st price reductions are as follows:

Lamp size	Old Price	New Price
50 watt (A)	22c	20c
60 watt (A)	22c	20c
25 watt (colored)	30c	25c
40 watt (colored)	30c	25c

The new prices will afford consumers a saving of two cents and five cents each on types of Mazda lamps that are extremely popular.

Setting the Standard for Over 80 Years

For over 80 years Fitchburg has been setting the standard for dryer felts. Over 80 years' experience has shown how to get that smooth, tightly woven surface that leaves no felt marks in the paper. It has shown us how to weave a strong, durable cotton duck felt that will last longer and with less down time for a broken felt. Paper makers who once use Fitchburg felts never use anything else.

There is a Fitchburg Cotton Dryer Felt for every paper—for fine ledger or bond, book or coarse papers. They are manufactured in English weave in two, three, four, five and six ply, from 60 to 288 inches in width.

When next thinking of dryer felts, think of "Fitchburg".

FITCHBURG DUCK MILLS
ESTABLISHED 1844
54 Duck Mill Road FITCHBURG, MASS.

1864 1929

"Excelsior" Felts

For EVERY GRADE of PULP & PAPER

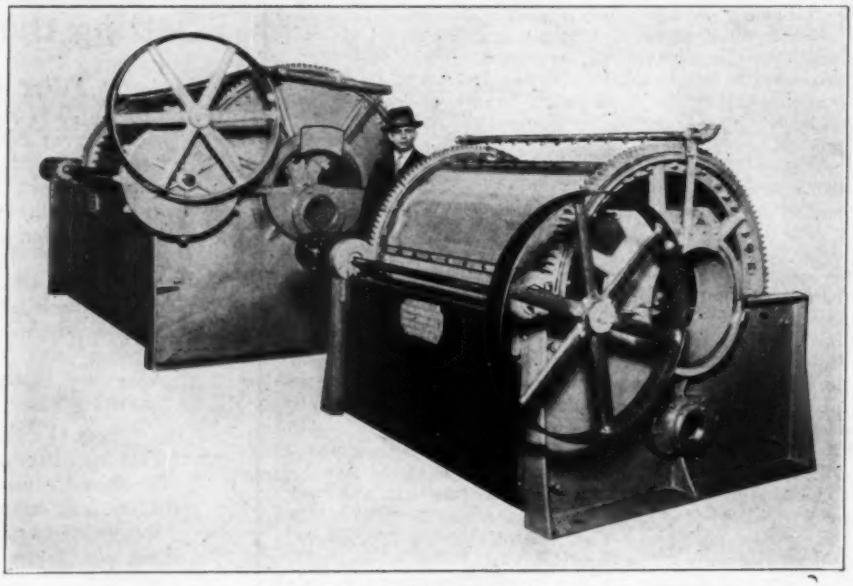
We continue to maintain at the top the quality of Excelsior Felts, as we have done since we, as pioneers, made *the first endless paper machine felts manufactured in America.*

Seamless felts for fast running.
Satin Style felts for finish.
Special felts to meet every condition.
Send us your felt problems.

KNOX WOOLEN COMPANY
CAMDEN, MAINE

Sold by
BULKLEY, DUNTON & COMPANY,
75-77 Duane Street, N. Y.
and direct

Save-alls
Filters
(Wire cloth and Sponge)
Shredders
Granite Bed Plates
Rod Mills
(Block lining)
Kelly Shower Pipes
Cylinder Valves
Sheet Cutters
(For Rogers)



LOW INLET — CENTER INLET

GREEN BAY FOUNDRY & MACHINE WORKS
Green Bay, Wis., U. S. A.

1,000,000,000

In 38 years of design and manufacture of water filters and softeners, Hungerford & Terry have installed an aggregate daily capacity of more than one billion gallons.

This experience has enabled them to aid paper and other manufacturers to improve their products and reduce their costs of production by the proper treatment of that important material—water.

Is your water supply properly protected to insure highly efficient mill operation and the highest quality in your product? Hungerford & Terry Engineers will investigate your conditions and report to you fully without obligation.

HUNGERFORD & TERRY
INC.
CLAYTON, N. J.

Clean Pipe Lines All of the Time

Slimy pipe lines mean dirty paper and consequently —waste.

It is easy to avoid this trouble with the Hayton Go-Devil. This instrument cleans pipe lines mechanically with no trouble and in a short time. Just insert the Go-Devil in the pipe, turn on the fresh water and out the other end comes all of the slime.

The propeller-like blades of the Go-Devil revolve against the pipe walls scraping off the fungus, leaving a clean line. By means of a strong flexible spring the bends are negotiated with ease.

We will gladly furnish any further information you may desire

HAYTON PUMP AND BLOWER CO.
Appleton, Wisconsin

New Catalogues, Books and Publications

Cleveland Electric Tramrail Div., Wickliffe, Ohio—An interesting folder is devoted to illustrations with explanatory notes featuring the type of equipment manufactured by this company for moving rolls of paper.

Connersville Blower Co., Connersville, Ind.—Bulletin 121 which supersedes 21C describes the general operating features of Victor rotary positive blowers and lists a number of the processes to which these blowers have been successfully applied. It also contains tables of capacities for machines arranged for belt drive and direct motor drive.

LaMotte Chemical Products Co., Baltimore, Md.—This company, one of the leaders in the development and production of materials and equipment for the colorimetric determination of hydrogen ion concentration and for water analysis, has just published the fifth edition of its book on "The A B C Hydrogen Ion Control". The book contains 132 pages, and the contents have been carefully compiled. The theory, methods of operation and a number of specific applications are, as heretofore, given in considerable detail and in such simple phraseology that they are entirely clear to the non-technical as well as the technical man. In the section on applications, the reader will find definite recommendations covering various operations and process control work. A complete line of materials and equipment for the analysis of water, sewage and industrial wastes is given.

Metropolitan Life Insurance Co., New York City—A number of research societies and large textile manufacturers have co-operated with this company in the preparation of a report on rayon. This book contains the complete story of rayon—the development of the industry, different processes used, markets and the effect of this product on this product on the consumption of cotton, silk and wool.

National Lumber Manufacturers Ass'n, Washington, D. C.—This association has arranged to issue a series of bulletins on roof construction for the information of architects, engineers and builders. The first of these features the Lamella roof, a trussless roof made of short wood members called "lamellas", which are bolted together to form a network of framing lumber, completely covering a building in arch form. The booklet gives a condensed though complete description of the principles of construction, also plans and specifications, together with a large number of illustrations. This publicity has the co-operation and assistance of the patentee, the Lamella Roof Syndicate, New York City, by whom the design was introduced in this country.

Stephens-Adamson Mfg. Co., Aurora, Ill.—A new 24-page skip hoist catalogue describes this type of equipment, giving the selection of sizes, features, classifications, tabular data, capacity schedules, typical installations and illustrative photos and engineering details. This catalogue also presents the S-A style "SD" skip hoist machine which is manufactured in three standard sizes, each size furnished with a number of different arrangements with motors and gears to give the desired speeds and capacities.

The Timken Roller Bearing Co., Canton, Ohio—The latest publication by this company is entitled "Wherever Wheels and Shafts Turn". There are 149 pages and the book is attractively bound. The text is divided into sections and different chapters take up the subjects of Timken Bearings in automotive equipment, railway equipment, industrial machinery, household appliances and farm machinery. The final section in the book contains technical information and engineering data. The text is amplified with a large number of illustrations and diagrams.

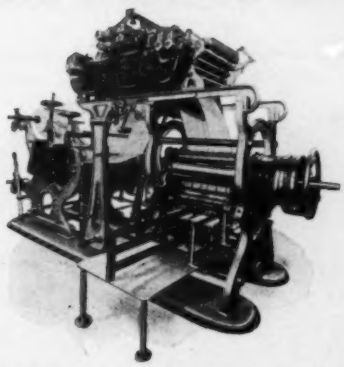
U. S. Iron Works, Portland, Ore.—The Balden Dutch Oven Furnace for burning waste wood fuel is featured in a new folder. The Balden furnace is designed to produce two or three times more steam than has heretofore been possible with the ordinary type of boiler furnace, and is adapted for all plants using waste wood fuel.

BOOK REVIEWS

Department of Commerce, National Bureau of Standards, Washington, D. C.—The third issue of the Standards Yearbook, the 1929 edition, has been released. In former issues of this publication, special attention was given to the organization and procedure of the numerous standardizing agencies in this country with brief outlines of certain national and international agencies. The present volume contains outlines of the activities and accomplishments of not only the National Bureau of Standards and other agencies of the federal government and the states, counties and municipalities, but also those of technical societies and trade associations, with special emphasis on their accomplishments during 1928, their programs for future work and the methods employed by each organization to encourage or facilitate the use of its standards and specifications. The contents also include an outline of methods employed in standardizing commercial weights and measures, a discussion of the present attempt to simplify the calendar by Chas. F. Marvin, chief of the United States Weather Bureau, an account of the activities and recent accomplishments of various foreign national standardizing bodies, a bibliography of recent publications relating to standardization contributed by courtesy of William Adams Slade, chief, division of bibliography, Library of Congress, and a brief discussion of international co-operation in standardization by John Gaillard, of the American Standards Association. The price is $1.00.

Hammermill Paper Co., Erie, Pa., has appointed the John Boshart Paper Co., Duluth, Minn. as agent to replace Peyton Paper Co.

A-S MACHINE CO.



Four Color Printing Unit attached to No. 4 Folder and Embosser

One of several designs used by Napkin Manufacturers and Converters. We design and manufacture Toilet Winders, Napkin Folders, Crepe Machines, Package Presses and Paper Specialty Equipment. Write for Catalogue

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GREEN BAY, WISCONSIN
Chicago Office: 574 Wrigley Bldg.
Manufacturers and Designers of Special Machinery

Ham Feltz says:

"I sees by the papers that the coal miners is complainin' that business is rotten. It's a good thing for them then that more of these here paper mills don't use Hamilton Felts. Coal business would be rottener still. Them Hamilton Felts take out more water so that there ain't so much sweatin' to be done in the dryers. It's the sweatin' out in the dryers that's hard on the coal pile."

Hamilton Felts

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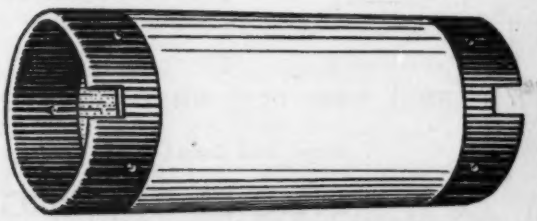
Corinth, N. Y. U. S. A.



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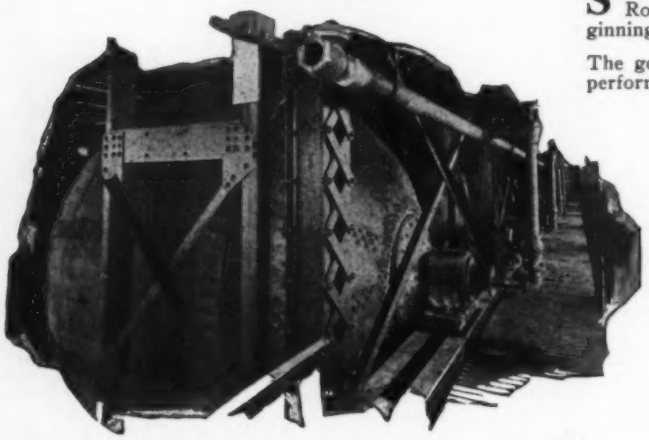

SOME paper mills in the late 80's were equipped with Biggs Rotaries—the first to be made by our Company in its beginning days.

The good-will that those early Rotaries built up with their fine performance **made** friends and **kept** them—today those same plants, enlarged again and again, have added more and still more Biggs Rotaries to provide increased output. Some of the largest paper companies operate 15, 25 and more Biggs units each.

* * * * * *

Biggs makes other things used by paper companies, too—steel stacks, penstocks, tanks, and other heavy steel plate production: Each is accurately fabricated for its exact purpose—each is good for the service it is to render, as Biggs Rotaries are in their field.

Your detailed blue prints and specifications are invited for estimate.

THE BIGGS BOILER WORKS COMPANY
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GLOBE and CYLINDER
ROTARY BLEACHING BOILERS
for Years of Dependable Cooking and Bleaching

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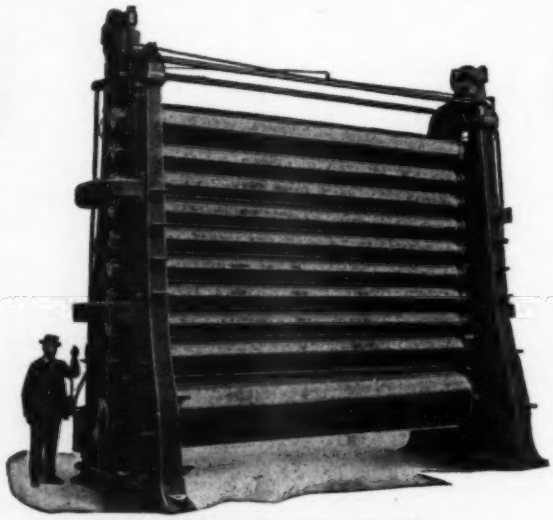
are made with
HYDRAULIC,
ELECTRIC
or
RATCHET
LIFT
all operated
from the floor



178" Stack with Hydraulic Lift

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CALENDER ROLLS
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all sizes up
to and including
298" on
the face

FARREL NEW TYPE ROLL GRINDER—ELECTRICALLY DRIVEN THROUGHOUT
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Stebbins Eng. & Mfg. Co.
D. Manson Sutherland, Jr.
H. S. Taylor.
Engineers (Drying)
J. O. Ross Eng. Corp.
Engineers (Heating and Ventilating)
J. O. Ross Eng. Corp.
Evaporators
E. B. Badger & Sons Co.
Swenson Evaporator Co.
The Zaremba Co.
Evaporators (Disc)
E. B. Badger & Sons Co.
Manitowoc Eng. Works.
Swenson Evaporator Co.
Exhausters
The Jeffrey Mfg. Co.
J. O. Ross Eng. Corp.
Fans
The Jeffrey Mfg. Co.
J. O. Ross Eng. Corp.
Fans (Lead Coated)
Gross Lead-Burning & Coating Corp.
Fans (Ventilating)
Meier Electric & Ma Co.
Feed Water Treatment
The Permutit Co.
Felts and Jackets
Appleton Woolen Co.
Bulkley, Dunton & Co.
Draper Bros. Co.
Fitchburg Duck Mills.
F. C. Huyck & Sons.
Orr Felt & Blanket Co.
Shuler and Benninghofen.
Waterbury Felt Co.
Felt and Wire Guides
Moore & White Co.
Felt Cleaning Material
Armstrong Chemical Co., Inc.
Oakite Products, Inc.
J. W. Hewitt Mach. Co.
Felt Washers
Gilbert J. Scofield Co.
Filter (Continuous Suction)
Oliver United Filters Inc.
Filters (Pressure and Gravity)
Hungerford & Terry, Inc.
The Permutit Co.
Oliver United Filters Inc.
Filters (Sponge)
Green Bay Foundry & Machine Works
Floor Plates (Safety)
Joseph T. Ryerson & Son, Inc.
Flour Sack Machinery
Smith & Winchester Mfg. Co.
Flow Meters
Bailey Meter Co.
The Brown Instrument Co.
The Foxboro Co., Inc.
General Electric Co.
Republic Flow Meters Co.
Fly Bars
Noble & Wood Mach. Co.
Fly Wheels
Link-Belt Company.
Folding Testers
Foreign Paper Mills, Inc.
Fourdrinier Machines
Bagley & Sewall Co., Inc.
Beloit Iron Works.
The Black-Clawson Co.
Downingtown Mfg. Co.
Gibbs-Brower Co.
Pusey & Jones Corp.
Rice, Barton & Fales, Inc.
Sandy Hill Iron & Brass Works.
Smith & Winchester Mfg.
Fourdrinier Wires
Appleton Wire Works.
Wm. Cabble Excelsior Wire Mfg. Co.
Eastwood Wire Corp.
Holyoke Wire Cloth Co.
Lindsay Wire Weaving Co.
The W. S. Tyler Co.
Freeness Testers
Foreign Paper Mills, Inc.
Furnaces
Combustion Engineering Corp.
Gas Analyzers
Charles Engelhard, Inc.
Gauges (Pressure)
Bailey Meter Co.
The Bristol Co.
Gauges (Sulphite)
Consolidated Ashcroft Hancock Co., Inc.
Gauges (Thickness)
Foreign Paper Mills, Inc.
Gears
Cleveland Worm & Gear Co.
Farrel-Birmingham Co., Inc.
Foote Bros. Gear & Mach. Co.
Hill Clutch Mach. & Fdy. Co.
Holyoke Mach. Co.
The Jeffrey Mfg. Co.
Link-Belt Company.
Gears (Fibre)
General Electric Co.
Gears (Herringbone)
Farrel-Birmingham Co., Inc.
Link-Belt Company
Terry Steam Turbine Co.
Gears (Silent Chain)
Link-Belt Company.
Gears (Worm)
Beloit Iron Works.
Cleveland Worm & Gear Co.
Foote Bros. Gear & Mach. Co.
Holyoke Mach. Co.
Link-Belt Company.
Generating Sets
Allis-Chalmers Co.
Electric Machinery Mfg. Co.
General Electric Co.
Westinghouse Electric & Mfg. Co.
Generators (Steam)
General Electric Co.
Terry Steam Turbine Co.
Generators (Turbo)
Allis-Chalmers Co.
General Electric Co.
Terry Steam Turbine Co.
Westinghouse Electric & Mfg. Co.
Glues
E. F. Russ Co.
Governors (Pump)
General Electric Co.
Grab Buckets
Link-Belt Company.
Granite Rolls
Beloit Iron Works.
Jones Bros. Co.
B. F. Perkins & Sons Co., Inc.
Grease
Standard Oil Co. (Ind.)
Texas Co.
Grease Cups
Link-Belt Company.
The Lunkenheimer Co.
Grinders (Pulp)
Gibbs-Brower Co.
Glens Falls Mach. Works.
Green Bay Barker Machine & Tool Works
Holyoke Mach. Co.
Grinding Wheels
Norton Co.
Hangers
Hill Clutch Mach. & Fdy. Co.
Holyoke Machine Co.
Link-Belt Company.
T. B. Wood Sons Co.
Heaters (Morterud)
Fibre Making Processes, Inc.
Heaters (Open Steam)
Biggs Boiler Works.
Heaters (Unit)
J. O. Ross Eng. Corp. Co.
Heaters (United Steam, Fan Blast)
J. O. Ross Eng. Corp.
Heating Systems
J. O. Ross Eng. Corp.
Hoists (Chain)
Roeper Crane & Hoist Wks., Inc.
Joseph T. Ryerson & Son, Inc.
Hoists (Electric)
General Electric Co.
Roeper Crane & Hoist Works.
Joseph T. Ryerson & Son, Inc.
Hoists (Head Gate)
Dayton Beater & Hoist Co.
Holyoke Machine Co.
Hoists (Portable, Air and Steam)
Allis-Chalmers Co.
Joseph T. Ryerson & Son, Inc.
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The Jeffrey Mfg. Co.
Link-Belt Company.
Hose
Boston Woven Hose & Rubber Co.
The B. F. Goodrich Rubber Co.
Morey Paper Mill Supply Co.
Quaker City Rubber Co.
The Republic Rubber Co
Humidity Testers
Foreign Paper Mills, Inc.
Hydraulic Machinery
Holyoke Mach. Co.
Southwark Fdy. & Mach. Co.
Hygrometers
Foreign Paper Mills, Inc.
Incinerators
The Biggs Boiler Works.
Manitowoc Eng. Works.
Indicators (CO_2, NH_3, SO_2, etc.)
The Bristol Co.
The Permutit Co.
Indicators (Speed)
Foreign Paper Mills, Inc.
Iron & Steel Supplies
Joseph T. Ryerson & Son, Inc.
Jordan Engines
Appleton Machine Co.
Emerson Mfg. Co.
Hermann Mfg. Co.
Noble & Wood Mach. Co.
Smith & Winchester Mfg. Co.
Jordan Fillings
The Mid-West Mach. Co.
Noble & Wood Mach. Co.
Kettles (Steam Jacketed)
The Biggs Boiler Wks. Co.
Manitowoc Eng. Works.
Riter-Conley Co.
Knives
Simonds Saw & Steel Co.
Knotters (Knot Screen)
Improved Paper Mach. Co.
Rice, Barton & Fales, Inc.
Kraft and Sulphate Pulps
The Borregaard Co., Inc.
Laboratory Machinery
Noble & Wood Mach. Co.
Lace Leather
Graton & Knight Co.
E. F. Houghton & Co.
Layboys
Gibbs-Brower Co.
Moore and White Co.
Leather Belting Cement
Graton & Knight Co.
Leather Packings
Graton & Knight Co.
E. F. Houghton & Co.
Left Paper Dryers
John Waldron Corp.
Lubricating Grease
Standard Oil Co. (Ind.)
Texas Co.
Lubricators
Eastwood Wire Corp.
The Lunkenheimer Co.
Machine Shop Equipment
Joseph T. Ryerson & Son, Inc.
Measuring Devices
Foreign Paper Mills, Inc.
Mechanical Draft Apparatus
The Jeffrey Mfg. Co.
Mechanical Pulp
J. Anderson & Co.
The Borregaard Co.
Metering Systems
Trimbey Mach. Wks.
Meters (Flow)
Bailey Meter Co.
The Foxboro Co., Inc.
General Electric Co.
Republic Flow Meters Co.
Micrometers (Desk and Pocket)
Foreign Paper Mills, Inc.
Microscopes
Foreign Paper Mills, Inc.
Motor Generator Sets
Allis-Chalmers Co.
Electric Machinery Mfg. Co.
General Electric Co
The Reliance Electric & Engineering Co.
Westinghouse Electric & Mfg. Co.
Motors
Allis-Chalmers Co.
Electric Mach. Mfg. Co.
Fairbanks, Morse & Co.
General Electric Co.
Reliance Elec. & Eng. Co.
Westinghouse Electric & Mfg. Co.
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Gibbs-Brower Co.
Hudson-Sharp Machine Co.
Paper Converting Mach. Co.
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Standard Oil Co. (Ind.)
Texas Co.
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Biggs Boiler Works Co.
Riter-Conley Co.
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Foreign Paper Mills, Inc.
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Swenson Evaporator Co.
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B. F. Goodrich Rub. Co.
Packing (Rubber)
Quaker City Rubber Co.
The Republic Rubber Co.
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The Nitrose Co.
The Vortex Mfg. Co.
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Gibbs-Brower Co.
Smith & Winchester Mfg. Co.
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Cameron Machine Co.
Gibbs-Brower Co.
Hamblet Machine Co.
Harris-Seybold-Potter Co.
Samuel M. Langston Co.
The Moore & White Co.
Smith & Winchester Mfg. Co.
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H. W. Butterworth & Sons Co.
Gibbs-Brower Co.
Holyoke Mach. Co.
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Perkins-Goodwin Co.
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Frank H. Davis Co.
Dominion Eng. Works
Downingtown Mfg. Co.
Gibbs-Brower Co.
Rice, Barton & Fales, Inc.
Pusey & Jones Corp.
Smith & Winchester Mfg. Co.
Chas. Walmsley & Co.
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Beloit Iron Works.
Cleveland Worm & Gear Co.
Cutler-Hammer, Inc.
General Electric Co.
Link-Belt Company.
Westinghouse Electric & Mfg. Co.
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Hammermill Paper Co.
Kalamazoo Veg. Parchment Co.
Paper Manufacturers' Supplies
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The Borregaard Co., Inc.
Diamond Alkali Co.
Gibbs-Brower Co.
The Mathieson Alkali Works.
Penn. Salt Mfg. Co.
Perkins-Goodwin Co.
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Gibbs-Brower Co.
Paper Scales
Foreign Paper Mills, Inc.
Paper Testing Machinery
Frank H. Davis Co.
Foreign Paper Mills, Inc.
B. F. Perkins & Son, Inc.
Parchment Manufacturers
Kalamazoo Veg. Parchment Co.
Penstocks
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Manitowoc Eng. Works.
Riter-Conley Co.
Perforated Metals
Charles Mundt & Sons.
Perforators
Gibbs-Brower Co.
Pillow Blocks
The Hill Clutch Mach. & Fdry. Co.
Link-Belt Company.
T. B. Wood Sons Co.
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Joseph T. Ryerson & Son Inc.
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The Biggs Boiler Works
Riter-Conley Co.
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Naylor Pipe Company
Joseph T. Ryerson & Son
Pipe Cleaner (Mechanical)
Hayton Pump & Blower Co.
Piping Equipment
Pittsburgh Piping and Equipment Co.
Pipe Systems Installed
Pittsburgh Piping & Equipment Co.
Platers
Holyoke Machine Co.
B. F. Perkins & Sons, Inc
Plates (Steel)
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Joseph T. Ryerson & Son Inc.
Pneumatic Thickeners
Improved Paper Mach Co.
Power Transmission
Allis-Chalmers Co.
The Carlyle Johnson Machine Co.
Hill Clutch Mach. & Fdy Co.
Jeffrey Mfg. Co.
Link-Belt Company.
T. B. Wood Sons Co.
Printing Presses
Gibbs-Brower Co.
Printing Machines
Gibbs-Brower Co.
John Waldron Corp.
Pulleys
Hill Clutch Mach. & Fdy Co.
Holyoke Mach. Co.
Link-Belt Company.
T. B. Wood Sons Co.
Pulp (Chemical)
J. Anderson & Co.
The Borregaard Co., Inc
Perkins-Goodwin Co.
Price & Pierce, Ltd.
The Pulp & Paper Trading Co.
Pulp Drying Systems
Technical Economist Corp.
Pulp Grinders
Glens Falls Mach. Wks
Green Bay Barker Machine & Tool Works
Holyoke Mach. Co.
Pulp Presses
Farrel-Birmingham Co., Inc.
Gibbs-Brower Co.
Southwark Fdy. & Mach Co.
Pulp Refiners (Howard)
Manitowoc Eng. Works
Pulp Stones
Norton Co.
Pulp Testers
Foreign Paper Mills, Inc.
Pulp Thickeners
The Moore & White Co
Oliver United Filters Inc.
Pulp Washers
Oliver United Filters Inc.
Pulpwood Stackers
The Jeffrey Mfg. Co.
Link-Belt Company.
Pulverized Fuel Equipment
Combustion Eng. Corp.
Erie City Iron Works
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Lawrence Pump & Engine Co.
Morris Machine Works
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Buffalo Steam Pump Co.
De Laval Steam Turbine Co.

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Old Plates Reclosed and Re-cut to Accurate Gauge
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Sole Manufacturers of the Union-Witham Screen Plate Vat and Fastener

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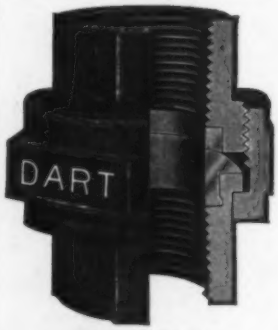
Careful, Intelligent, Quick Service



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ACID RESISTING
VALVES

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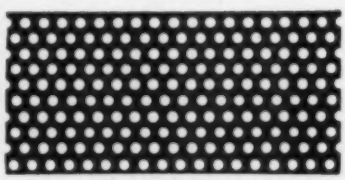
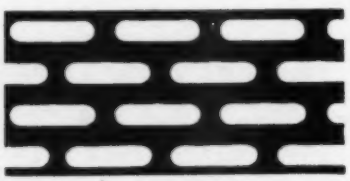
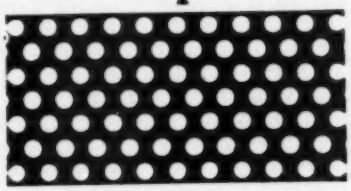


.065 inch round



3/16 x 1/4 inch Slots



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Hayton Pump & Blower Co.
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Lawrence Pump & Engine Co.
The Moore & White Co.
Morris Machine Works
Smith & Winchester Mfg. Co.
Warren Steam Pump Co.

Pumps (Deep Well)
American Well Works
Layne & Bowler, Inc.

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Beloit Iron Works.
Buffalo Steam Pump Co.
Byron Jackson Pump Co.
Frank H. Davis Co.
Downingtown Mfg. Co.
Gibbs-Brower Co.
Glens Falls Mach. Wks.
Hayton Pump & Blower Co.
Lawrence Pump & Engine Co.
The Moore & White Co.
Morris Machine Works
Noble & Wood Mach. Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Co.

Pumps, Turbine
Hayton Pump & Blower Co.

Pumps (Vacuum)
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Gibbs-Brower Co.
Connersville Blower Co.
Nash Eng. Co.
Oliver United Filters Inc.

Pyrometers
The Bristol Co.
Chas. Engelhard, Inc.

Rag Cutters
Gibbs-Brower Co.
Holyoke Machine Co.
B. F. Perkins & Son, Inc.

Rag and Paper Dusters
Gibbs-Brower Co.
Holyoke Mach. Co.

Rebuilt Machinery
Frank H. Davis Co.

Reclaiming Machinery
Improved Paper Mach. Co.
Swenson Evaporator Co.
The Zaremba Co.

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Charles Engelhard, Inc.
The Permutit Co.

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The Bristol Co.
Consolidated Ashcroft Hancock Co., Inc.
The Foxboro Co., Inc.
Co.

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Farrel-Birmingham Co., Inc.
Foote Bros. Gear & Mach. Co.
Hill Clutch Mach. & Fdy. Co.
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Terry Steam Turbine Co.

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The Moore & White Co.
Smith & Winchester Mfg. Co.

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Hudson-Sharp Machine Co.

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Hermann Mfg. Co.
Improved Paper Mach. Co.

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Gibbs-Brower Co.
Holyoke Mach. Co.
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John Waldron Corp.

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John Waldron Corp.

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Cincinnati Rubber Mfg. Co.
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Stowe & Woodward Co.

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Morey Paper Mill Supply Co.
T. B. Wood Sons Co.

Rope (Cotton)
Morey Paper Mill Supply Co.

Rope (Transmission)
Morey Paper Mill Supply Co.

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Adirondack Mineral Co., Inc.
Empire Size & Chem. Corp.
Hercules Powder Co.
Kalbfleisch Corp.
Paper Makers Chem. Co.
Superior Sizing Co., Inc.
Vera Chem. Co., No. Milwaukee, Wis.
Vera Chem. Co. of Canada, Ltd., Freeman, Ont.
Vera Chem. Corp., Stoneham, Mass.
Western Paper Makers Chem. Co.

Rosin Melters
Manitowoc Engineering Works.

Rotaries
The Biggs Boiler Works Co.
Gibbs-Brower Co.
Manitowoc Eng. Works.
Riter-Conley Co.

Rotary Bleaching Boilers
The Biggs Boiler Works Co.
Manitowoc Eng. Works.

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Joseph T. Ryerson & Son, Inc.

Satin White
Kalbfleisch Corp.

Save-Alls
Gibbs-Brower Co.
Glens Falls Mach. Works.
Green Bay Foundry & Machine Works
Improved Paper Mach. Co.
The Moore & White Co.
Oliver United Filters Inc.

Saws
Allis-Chalmers Co.
Simonds Saw & Steel Co.

Scales
Fairbanks Morse & Co.
Toledo Scale Co.

Scales (Continuous Weight Control)
Toledo Scale Co.

Scales (Desk and Pocket)
Foreign Paper Mills, Inc.

Scales, Automatic (Coal)
Richardson Scale Co.

Screens
Frank H. Davis Co.
Downingtown Mfg. Co.
Gibbs-Brower Co.

Screens (Centrifugal)
Improved Paper Mach. Co.
Rice, Barton & Fales, Inc.

Screens (Perforated Metal)
Charles Mundt & Sons.

Screens (Rotary)
American Paper Mach. & Eng. Works
The Moore & White Co.
Trimbey Mach. Wks.

Screens (Woven Wire)
The W. S. Tyler Co.

Screen Diaphragms
The B. F. Goodrich Rubber co.

Screen Plates
William A. Hardy & Sons.
Union Screen Plate Co.

Second-Hand Equipment
Frank H. Davis.
Gibbs-Brower Co.

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Foreign Paper Mills, Inc.

Shafting
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Hill Clutch Mach. & Fdy. Co.
Link-Belt Co.
The Mid-West Mach. Co.
Joseph T. Ryerson & Son, Inc.
T. B. Wood Sons Co.

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Joseph T. Ryerson & Son, Inc.

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Green Bay Foundry & Machine Works
F. W. Roberts Mfg. Co.
Smith & Winchester Mfg. Co.

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Gibbs-Brower Co.
Green Bay Foundry & Machine Works
Rice, Barton & Fales, Inc.
The Ryther & Pringle Co.

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The Jeffrey Mfg. Co.
Link-Belt Co.
Morse Chain Co.

Silicate of Soda
Philadelphia Quartz Co.

Size
Kalbfleisch Corp., The

Sizing, Testers
Foreign Paper Mills, Inc.

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The Moore & White Co.

Slitting and Rewinding Machinery
Beloit Iron Works.
Cameron Machine Co.
Gibbs-Brower Co.
Hamblet Machine Co.
Samuel M. Langston Co.
John Waldron Corp.

Sluice Gates
The Dayton Beater & Hoist Co.

Soda Ash
Diamond Alkali Co.
The Mathieson Alkali Works.
Solvay Process Co.

Special Machinery
Beloit Iron Works.
Frank H. Davis Co.
Gibbs-Brower Co.
Green Bay Barker Machine & Tool Works
Hudson-Sharp Machine Co.
John Waldron Corp.

Speed Changes
Lewellen Mfg. Co.
Moore & White Co.

Speed Reducers and Transformers
Hill Clutch Mach. & Fdy. Co.
W. A. Jones Foundry & Mach. Co.
Link-Belt Company

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Cleveland Worm & Gear Co.
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
Foote Bros. Gear & Mach. Co.
Hill Clutch Mach. & Fdy. Co.
Link-Belt Company
Mid-West Machine Co.

Sprockets
The Jeffrey Mfg. Co.
Link-Belt Co.

Stacks
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Manitowoc Eng. Works.
Riter-Conley Co.

Starch
Corn Products Refining Co.

Steam Accumulators
Ruths Steam Storage, Inc.

Steam Fits
Shartle Bros. Mach. Co.

Steam Generating Equipment
Combustion Eng. Corp.
Heine Boiler Co.
Ladd Water Tube Boiler Co.

Steam Regulators (For Dryers)
W. F. Pickles.

Steam Storage
Ruths Steam Storage, Inc.

Steel (Bars, Shapes, Plates, Sheets, Etc.)
Joseph T. Ryerson & Son.

Steel Plate Construction
The Biggs Boiler Works Co.
Manitowoc Eng. Works.
Riter-Conley Co.
The Youngstown Boiler & Tank Co.

Steel Strapping
Signode Steel Strapping Co.

Stock Inlets
Valley Iron Works Co.

Stokers
American Eng. Co.
Combustion Eng. Corp.
Combustion Eng. Corp., Ltd.
Westinghouse Electric & Mfg. Co.

Storage Tanks (Steel)
The Biggs Boiler Works Co.
Riter-Conley Co.

Straps (Leather)
E. F. Houghton & Co.

Stuff Chests
Gibbs-Brower Co.
The Moore & White Co.
Mid-West Machine Co.
Noble & Wood Mach. Co.

Stuff Pumps
Beloit Iron Works.
Gibbs-Brower Co.
The Moore & White Co.
Noble & Wood Mach. Co.

Suction Box Covers
J. W. Hewitt Mach. Co.

Suction Rolls
Paper & Textile Mach. Co.

Sulphate of Alumina
General Chemical Co.
Kalbfleisch Corp.

Sulphite (Strong Bleached and Easy Bleaching)
The Borregaard Co., Inc.
Perkins-Goodwin Co.

Sulphite Bleachers (Rotary)
The Biggs Boiler Works Co.
Manitowoc Eng. Works.

Sulphite Fittings
Eastwood Wire Corp.
Wm. A. Hardy & Sons Co.

Sulphite Machinery
The Biggs Boiler Works Co.
Manitowoc Eng. Works.

Sulphur
Texas Gulf Sulphur Co.

Sulphur Burners
Glens Falls Mach. Works.
American Paper Mach. & Eng. Works

Superheaters
Foster Wheeler Corp.

Tachometers and Tachographs
The Bristol Co.
Consolidated Ashcroft Hancock Co., Inc.
Foreign Paper Mills, Inc.

Tailing Screener (New)
Improved Paper Mach. Co.

Tanks (Elevated Steel)
Riter-Conley Co.
The Youngstown Boiler & Tank Co.

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